EFFECTIVENESS OF SLEEP INTERVENTION STRATEGIES ON SLEEP QUALITY AND DAYTIME SLEEPINESS AMONG THE ELDERLY

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL 2012

CERTIFICATE

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Give thanks unto the Lord; for he is good: for his mercy endureth for ever."

-Psalms, 136: 1

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ABSTRACT

No matter what the age is, sleeping well is essential for physical health and emotional wellbeing. For the elderly good night sleep is especially important because it helps improve concentration and memory formation, allows the body to repair any cell damage that occurred during the day and refreshes the immune system which in turn helps to prevent disease. So the present study was undertaken to evaluate the effectiveness of sleep intervention statergies on sleep quality and daytime sleepiness of the elderly people residing in oldage homes.Quasi experimental design with non equivalent pretest and posttest control group design was adopted for this study.Samples were the elderly people in the age group of 60 – 80 years who fit the inclusion criteria. Samples size was 60. Tools used were Epworth Daytime Sleepiness scale to assess the daytime sleepiness and Pittsburgh Sleep Quality to assess the sleep quality of the elderly. The sleep intervention strategies which included were structured teaching program on sleep hygiene, aerobic exercises and aromatherapy were administered for 5 weeks to the experimental group. Both descriptive and inferential statistics were used and the study findings were as follows**:**

In the pre-test all the elderly in the experimental group and control group had poor sleep quality.Among the elderly, in the experimental group 86.6% had borderline daytime sleepiness and 13.3% had abnormal daytime sleepiness, whereas in the control group 83.3% had border time daytime sleepiness and 16.6% had abnormal daytime sleepiness.Elderly who underwent intervention had good quality sleep. [the mean pretest sleep quality score 6.5 (experimental group) and 12.3 (control group); ‘t’ value 13.10; ‘p’ value (0.01) and the [mean posttest daytime sleepiness score 2.76 (experimental group) and 9.76 (control group); “t” value 20.27; p (0.01)] were highly significant and the elderly remained alert during day time than their counterparts in the control group which was evident in the posttest score. Sleep intervention statergies is an effective non – pharmacological intervention in the treatment of sleep problems in the elderly.

CHAPTER – I

INTRODUCTION

BACKGROUND OF THE STUDY

What is means to be old

It means stepping down and stepping aside

It means more time alone

It means neglect

It means less money

It means giving up things

It means loss

It means accepting help from others

It means the threat of illness or disabilities

It means being frightened

It means accepting past failures and realizing that much

of the record of one's life is in

It means trying to figure out what one's life has meant

It means figuring out what you want to get done before you die

It means facing death.

- Anonymous

A silent revolution has occurred in the last 100 years unseen, unheard and yet so close. The biggest achievement of the century is longevity. All over the world, life expectancy has raised leading to a sharp rise in the number of older persons. Aging is a universal, normal, inevitable biological phenomenon. The society which fosters research to save human life cannot escape the responsibility for the life thus extended. Aging is generally defined as a process of deterioration in the functional

capacity of one individual that results from structural changes. India is growing older. The life expectancy has gone up from 20 years in the beginning of the 20th century to 62 years today. Better medical care and low fertility have made the old the fast growing section of the society. A United Nation report has predicted that India will have 198 million old people (> 60 years) is 2030 and 326 million in 2050 (Cited by American Academy of Medicine)

However, this is not without problems ,with this kind of an ageing scenario, there is pressure on all aspects of care of the older person's, be it financial, health or shelter. With older people living longer, the house holds are getting smaller and congested, causing stress in joint and extended families .There are several changes that occur as part of the normal aging process. These life events or transitions disrupt or threaten to change an individual's normal routine and activities and consequently can affect an individual's well being. (Mcleod, 1996)

Good health comprises of both physical and psychological health. Ageing is not synonymous with disease but disease become more common as age progress. Increasing age in the elderly is associated with the higher morbidity and frequent use of health services. Psychiatrists believe that fulfilling the physiological, psychological and emotional needs of elderly in the key to keep then healthy and happy. (Mayer,1999)

"Sleep is a golden chain that ties health and bodies together".

- Thomas Decker

Sleep is an essential part of healthy lifestyle, like nutrition and exercise, noted Zee, a professor of neurology neurobiology & physiology. By improving a person's sleep, we can improve the physical and mental health Zee said, "Sleep is a barometer of health, life someone's temperature. It should be the fifth vital sign.

For all people, sleep is part of the rhythmus of life. Without a good sleep, the body loses the ability to revitalize, the mind in less adapt and one's mood is altered. Circardian rhythms have a major impact on older adults' health and well being.Normal ageing changes conspire to interfere with the quality of sleep, while health and medication use can affect the sleep patterns in a negative manner.

As an individual age, several changes in the normal sleep pattern occur. More time is necessary to fall asleep upon retiring to bed. Maintaining sleep continuity is often difficult, as sleep becomes increasingly fragmented. The amount of time spent in deeper levels of sleep is decreased. As a consequence, more time is spent awake and in lighter stages of sleep. The elderly appear to be more easily awakened from environmental stimuli and sleep often does not seem as restful. Circadian rhythms also appear to change. The "internal clock" shifts, so that elderly persons often retire to bed earlier in the evening and awaken earlier in the morning. But when the schedules and time demands of the external world intrude, sleep suffers. Some of this may be due in part to intrinsic changes in circadian rhythms associated with ageing. However, other factors may contribute including lack of exercise, lack of socially,

physically or mentally stimulating external environment, too much time spent in bed, and significant sensory impairments.(National Library of Medicine, 2010)

In addition a number of co-morbid conditions which lead to noctural awakening e.g. nocturia, trochanteric bursitis, orthopnea, and gastro esophageal reflux occur more frequently in the elderly, often resulting in an increase in day time sleepiness and an increase in napping. This may cause the sleep pattern in the elderly to become polycylic in nature, such that several sleep-wake cycles occur within 24 hour period. This polycyclic pattern is similar to the normal sleep pattern of infants, and is especially prevalent in the nursing home setting. As a result many elderly experience a significant decrease in sleep efficiency and sleep satisfaction .Decrease in sleep quality and sleep efficiency affects the quality of life.(National Library of Medicine,2010)

A nursing assessment of sleep begins with a comprehensive assessment of sleep quality and sleep patterns. The nurse may be able to improve the sleep problem immediately with interventions or work with the health care team to assess the sleep problems in greater depth. Treatment should target both the sleep problem and any co-morbidities thus optimizing the chance for improvement in quality of life and functioning of older adults.

SIGNIFICANCE AND NEED FOR THE STUDY

The 21 century is often called the ‘’age of aging”. One of the world greatest challenges of the present century is the enormous increase in the absolute, number and proportion of older persons in the world. According to the United Nations projections, by the year 2050,the number of older persons is expected to be more than three fourth,

from 600 million to almost 2 billion. As per 2001 census the elderly population of India accounted for 77 million in 1961,it is increased to 43 million in 1961,it is increased to 43 million in 1981 and to 57 million in 1991.The elderly population aged 70 and above which was only 8 million in 1961 rose to 21 million in 1991and 29 million in 2001. The proportion of elderly above 70 in the total population increased from 2 % in 1961 to 2.9 % in 2001.The Indian population census reported 99,000 elderly in 1961, this number rose to 138,000 in 1991.Age wise data in census of India in 2001 indicates that India's aging population is on rise.(Ministry of Statistics and Programme Implementation, 2011)

Human beings spend almost a third of their lives in sleeping. The prevalence of sleep dissatisfaction increases steadily with age. It has been estimated that sleep disturbances affect more than 50% of community dwelling older adults over 65 years of age as well as an estimated two- thirds of institutionalized elderly persons .Several physical and psychological changes are known to occur with normal ageing, however adjustment to changes in sleep quality and quantity can be among the most difficult. Although sleep disturbance is a common complaint among patient of all ages, research suggests that older adults are particularly vulnerable. A large study of over 9,000 older adults age of > 65 year found that 42% of participants reported difficulty initiating and maintaining sleep, follow up assessment 3years later revealed that 15% of participants who did not report sleep difficulty at baseline had disturbed sleep, suggesting the annual incidence rate of approximately 5%.Although changes in sleep architecture are to be expected with increasing age, age itself does not result in disturbed sleep, rather it is the ability to sleep that decreases suggesting an annual incidence rate of approximately 5% .Although with age, often as a result of the other

changes in sleep architecture are to be expected with increasing age, age itself does not result of the other factors associated with aging.(Ancoli & Roepk ,2010)

Sleep requirement vary from person to person, most healthy adults tend to require between 7.5 to 9 hours of sleep per night to function at their best. A recent study by the National Institute of Health suggests that healthy older people may require about 1.5 hours sleep than younger adults, an average of 7.5 hours per night. The study indicates that elderly sleep less even when the opportunity for more sleep because of age related changes in the ability to fall asleep and remain asleep, while the results of the study may not be conclusive it is important to focus more on how one feel following a night's sleep rather than the specific number of hours one spend asleep. Quality is as important as quantity. Some elderly mistakenly believe they have a sleeping problem because they go to bed expecting to be asleep for 8 or 9 hours a night and may even needlessly start using medications to help them sleep more. Frequently waking up not feeling rested or feeling tired during the day are better indications that one is not getting enough sleep at night and may have a sleep problem that needs to be addressed.(Robinson, kemp & Segal,2011)

With age several changes occur that can place one at risk for sleep disturbance, including increased prevalence of medical conditions, increased medication use, age related changes in various circadian rhythms, and environmental and lifestyle changes, medical and psychiatric conditions.(Ancoli & Roepke, 2010)

The importance of sleep and impact of lack of sleep on the elderly

No matter what the age is, sleeping well is essential for physical health and emotional wellbeing. For the elderly good night sleep is especially important because it helps improve concentration and memory formation, allows the body to repair any

cell damage that occurred during the day and refreshes the immune system which in turn helps to prevent disease. Many physician consider sleep to be a barometer of a persons health like taking the temperature. Elderly who don't sleep well are more likely to suffer from depression, attention memory problems and excessive day time sleepiness. They are also likely to suffer more night time falls, have increased sensitivity to pain, and use more prescription or over the counter sleep aids. Insufficient sleep can also lead to many serious health in older adults, including an increased cardio vascular diseases, diabetes, weight problems and breast cancer in women.(Robinson, kemp & Segal, 2011)

Refreshing sleep requires sufficient total sleep time as well as sleep that is in synchrony with the individuals circadian rhythm. Problems with sleep organization in elderly patients typically include difficulty falling asleep, less time spent in the deeper stages of sleep, early morning awakening and less total sleep time. Poor sleep habits such as irregular sleep-wake times and daytimes napping may contribute to insomnia. Caffeine, alcohol and some medications can also interfere with sleep. Primary sleep disorders are common in the elderly than in younger persons. (Neubauer, 2010)

The reasons underlying elderly sleep disturbances are complex. Considering the impact that sleep disturbance can have on health, it is important to pay special attention to sleep quality among elderly. To achieve greater sleep efficiency a combination therapy is recommended such as psychological therapies which include cognitive behavior therapy, pharmacological interventions, sleep hygiene education and other treatments like massage, aromatherapy, aerobic exercises etc.(Ancoli & Roepk, 2010)

Dennis (2002) conducted a study which included 43elderly who were examined for the effectiveness of aerobic exercise. At post treatment, sleep onset latency improved for both men and women. Total sleep duration, sleep onset latency and scores on a scale of global sleep quality showed significant improvement.

Fleg (2008) have found in a research study that aerobic exercise can improve psychosocial wellbeing, promote sleep, improve mental status, cardiac function, better functional capacity and modification of coronary risk factors. Studies have demonstrated that elderly who did aerobic exercise had reductions in sleep problems.

A study was conducted by Randenbush (2008) where the bedrooms of nursing homes was perfumed with the scent of lavender induced sleep in the elderly residents with insomnia comparable to sleeping pills. The results showed that the residents with lavender scent slept longer and better and felt more rested, energetic and alert next morning.

Jefferson (2005) conducted a study on structured teaching program on sleep hygiene of elderly with insomnia Samples reported of more naps per week, smoking near bedtime.Teaching on sleep hygiene was given and the samples were evaluated using Pittsburgh sleep quality scale. The results showed that the samples reported increase in sleep duration, decrease in naps during the day time, sleep latency and night time wakefulness.

It is seen that providing health services to the old people who live in the nursing home is very necessary and important. It is thought that evaluation of sleep time and planning of interventions to promote sleep is essential. As a general rule non pharmacological treatment options should be available such as aerobic exercises,

aromatherapy, sleep hygiene etc., Combinations of all these therapies is a nurse initiated intervention that has the advantage of being cost effective, therapeutic, social and recreational for the institutionalized older adult.

The researcher‘s own experience and the related review has inspired and motivated the researcher to conduct the present study.

STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness of sleep intervention strategies on sleep quality and daytime sleepiness of the elderly people residing in old age homes.

OBJECTIVES:

1. To assess the sleep quality in elderly people before and after the sleep intervention strategies in the experimental and control group.
2. To assess the daytime sleepiness in elderly people before and after the sleep intervention strategies.
3. To evaluate the effectiveness of sleep intervention strategy on sleep quality and day time sleepiness among the elderly.
4. To evaluate the effectiveness of sleep intervention strategy on day time sleepiness among the elderly.
5. To associate the sleep quality of elderly with their selected demographic variables of the elderly.
6. To associate the day time sleepiness of the elderly with their selected demographic variables.

HYPOTHESIS:

All the hypothesis will be tested at 0.05 level of significance.

H1:

The mean post-test sleep quality score will be significantly greater than the mean pretest score of the elderly who had sleep intervention statergies.

H2:

The mean posttest daytime sleepiness score will be significantly lesser than the mean pretest score of the elderly people who had sleep intervention statergies.

H3:

The mean posttest sleep quality score of the elderly in the experimental group will be higher than the mean posttest sleep quality score of the elderly in the control group.

H4:

The mean posttest daytime sleepiness scores will be significantly lesser in the experimental group than the mean post test daytime sleepiness in the control group.

H5:

There will be a significant association between the post test sleep quality of elderly in the experimental group and selected demographic variables like age, gender, marital status, religion, education and leisure time activity.

H6:

There will be a significant association between the daytime sleepiness of the elderly in the experimental group and the selected demographic variables like age, gender, marital status, religion, education and leisure time activity.

OPERATIONAL DEFINITION:

Effectiveness:

In this study the effectiveness refers to the outcome of sleep intervention stratergy in improving the sleep quality and reducing day time sleepiness as measured by Pittsburgh Sleep Quality Scale and Epworth Daytime Sleepiness scale.

Sleep intervention stratergy:

Sleep intervention stratergy refers to selected interventions like structured teaching on sleep hygiene, aerobic exercises and aromatherapy that will be administered to elderly with sleep problems.

Aerobic Exercise:

In in study aerobic exercises refers to the physical activity like walking and strength exercises which will be taught and the elderly in the experimental group will be encouraged to participate in groups, (30 members 10 in each group) for 4 times a week (Monday, Wednesday, Thursday and Saturday) for a duration of 30 minutes each for 5 consecutive weeks.

Aroma Therapy:

In this study aroma therapy refers to the dilution of lavender oil 12 drops in 60 ml of carrier vegetable oil; and the 3 drops of this mixture is applied to a tissue and left near the bedside of the elderly with sleep problems every night before bedtime for 5 consecutive weeks.

Teaching on Sleep Hygiene

In this study teaching on sleep hygiene refers to the face to face group interaction in which the investigator provides information regarding sleep physiology,

prevalence of sleep problems, healthy bedtime, behavioural practices and environmental conditions, that would be delivered in a single group session (10 in each group; a total of three group) for a duration of 45- minutes to 1 hour using flash cards.

Sleep Quality:

In this study it refers to the subjective measures of the ability to initiate and maintain sleep by the elderly as measured by Pittsburgh Sleep Quality Index.

Day time sleepiness:

It refers to the subjective report of an increased desire to fall asleep and lack of energy during the day as measured by Epworth Daytime Sleepiness Scale.

Elderly:

It refers to people above the age of 60 yrs residing in selected old age home with sleep problem.

Assumption:

- Sleep disturbance is common among elderly.
- Sleep disturbance affect the quality of life in the elderly.

Projected Outcome:

This study will reveal the existing level of sleep problems among the elderly people residing in selected old age home at Madurai. It also will highlight the effectiveness of non pharmacological approaches especially aerobic exercise, aromatherapy & teaching on sleep hygiene in promoting sleep in elderly. The result of the study will be a strong motivator and will provide insight for health professionals to initiate sleep intervention strategies in the elderly population.

Findings of this study will help health professionals to plan sleep intervention strategies in elderly wilth sleep problems and certainly it will add value to geriatric nursing.

Delimitation:

- The study was delimited to selected old age home.
- The data collection period was limited to 6 weeks.

CONCEPTUAL FRAME WORK

This study is based upon Widenbach's helping art of clinical nursing theory. Widenbach first published her ideas in 1964 in clinical nursing. The further refined her theory in nursing wisdom in nursing theory published in 1970.

Widenbach's views nursing as an art based as goal directed care. Factual and speculative knowledge judgement, and skills are necessary for effective nursing practice.

Widenbach's vision of nursing practice closely parallels assessment, implementation and evaluation steps of nursing process.

According to Widenbach, nursing practice consists of identifying a patient's need for help, ministering the needed help and validating that the need for help was met. The main concepts of this study are,

1. Identifying a need for help
2. Ministering needed help
3. Validating the need for help was met.

Identifying a need for Help:

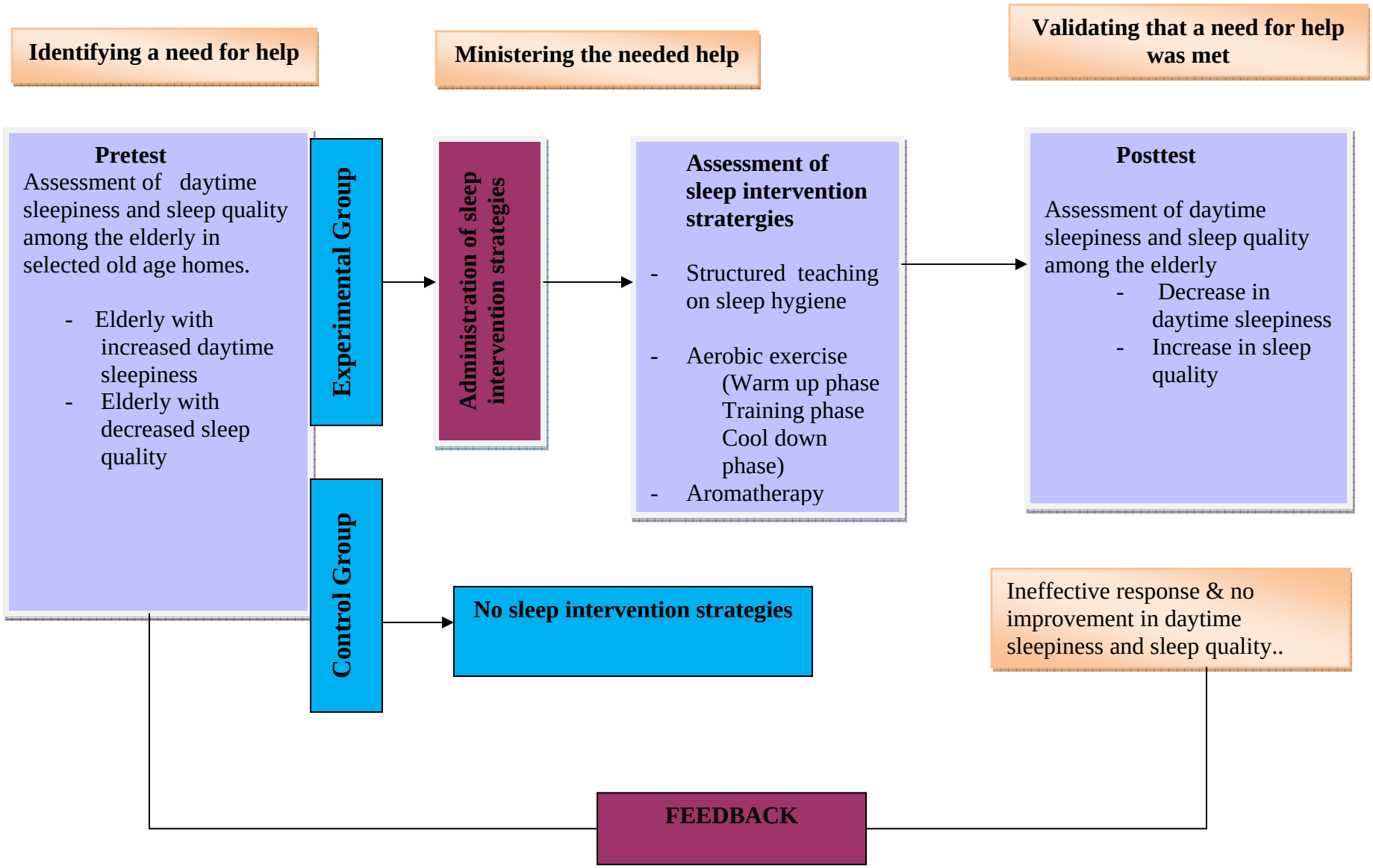
Here the individual is considered as a unique experience person. Person needs are determined and seen whether the person realizes the need and what prevents the person from meeting the need. In this study it refers to the assessment of sleep problems, in the elderly before the sleep intervention strategies.

Ministering the Needed help:

It measures to meet the need of the individual who needs help. In this study it refers to ministering sleep intervention strategies to the elderly validating that a need for help was met.

It is to evaluate and shows the individual need have been met and his functional ability has been returned as a direct result of the nurse action. In this study it refers to post assessment of sleep problems after sleep intervention strategies. There will be reduction in sleep problems.

CONCEPTUAL FRAMEWORK FOR WIEDENBACH'S HELPING ART OF CLINICAL NURSING



CHAPTER – II

REVIEW OF LITERATURE

The review of literature was done from published articles, textbooks, reports of Medline search literature review as organized and presented under the following headings are, definition normal sleep, sleep and aging, causes, sleep problems in elderly, insomnia risk for elderly, effects of lack of sleep, management of sleep problems in elderly.

- Old age
- Review related to sleep and sleep problems in the elderly
- Review related to Aerobic exercise in promoting sleep in the elderly
- Review related to effectiveness of aromatherapy in promoting sleep in the elderly
- Review related to sleep hygiene in promoting sleep in the elderly

I-Old Age:

You are as young as your faith, as old as doubt, as young as your self-confidence, as old as your fear, as young as your hope, as old as your despair.

- Dougles Mac Arthur

Aging is a process that begins with conception but in practice, ageing is regarded as that phase in life, when body functioning begins to decline resulting in the loss of adaptive response to stress and increasing risk of age related disease.

The three common warp of understanding old age are physiological, psychological and socio cultural, physiologically a person is old when signs of

wearing out of the body appears like wrinkling of skin and greying of hair, psychologically demarking, it is by various mental disabilities such as memory, intelligence, emotional reactions and attitudes and socio culturally a person is aged when he distances himself from the normal roles and status.

Definition of Ageing:

Ageing can be defined as a progressive functional decline or a gradual deterioration of physiological function including a decrease in fecundity or the intrinsic, inevitable and irreversible age related process of loss of vitality and increase in vulnerability (Patridge & Mangel, 1999).

Ageing is the process of growing old, is defined as a gradual biological impairment of the normal function (Strehler, 2007).

Biologic Ageing: Refers to changes in structure and functions of the body that occur over the life span (Zarit,1980)

Sociologic Ageing: Refers to the roles and social habits of individuals in society (Birren & Renner, 1977).

Functional Ageing: Refers to the capacities of individuals for functioning in society, as compared with that of others of the same age (Birren & Renner, 1977).

Psychologic Ageing: Refers to behavioural changes in self and perception and reactions to biologic changes (Gress & Bate,1984)

Spiritual Ageing: Refers to changes in self and perceptions of self to others, of the place of self in the world and the self world view (Stoll, 1975).

Late adulthood is recognized as beginning about age 65 and covering the remaining years until death, which could represent a span of 40 years or more. It may be more appropriate to think of late adulthood as encompassing several groups

The young (older) adult: Late sixties to early seventies.

The middle older adult:Late seventies to early eighties.

The older adult: more than 85 years.

The World's elderly day is celebrated on 1st of October every year. This is not just to celebrate but to care them, honour them and to comfort, medical care and happiness to the old persons especially who are without family care.

India is the 2nd largest country in the world with 72 million elderly persons above 60 years of age as 2001. According to UN projections, the elderly in the age group 60 and above is expected to increase from 71 million in 2001 to 179 million an 2031, and further to 301 million in 2051; in case of those 70 years and older, they are projected to increase from 27 million in 2001 to 13 2 million in 2051. Among the elderly persons 80 and above, they are likely to improve their numbers from 5.4 million in 2021 to 32 million in 2051. (Ministry of Stastistics and Programme Implemntation, 2011)

II- Sleep and Sleep Problems in the Elderly

Normal Sleep: (Neubauer, 2010)

Two primary factors control the physiologic need for sleep: the total quantity of sleep and the daily circadian rhythm of sleepiness and alertness. For optimal daytime alertness, humans require an average of about eight hours of sleep for a 24-hour period. Sleep deprivation causes increased sleepiness and may cause cognitive impairment.

Under normal conditions, the circadian rhythm promotes a daily cycle of nighttime sleep and daytime alertness. Also commonly experienced is the physiologic mid-afternoon dip in alertness, which can be conductive to napping. It is now well established that a person's circadian rhythm is strongly influenced by exposure to light.

Normal sleep progresses through a number of stages during each sleep period. Rapid-eye movement (REM) sleep encompasses 15 to 25 percent of the total amount of sleep and is associated with dreaming, as well as increased liability of heart rate, blood pressure and respiration. Non-REM sleep is subdivided into four stages of increasing depth. The deepest non-REM sleep generally occurs in the early part of the night. Episodes of REM sleep occur at approximately 90-minute cycles, with the duration of each episode tending to increase throughout the night. Elderly persons have more fragmented sleep and a shorter duration of stage 3 and stage 4 sleep than that occurring in young adults.

Classification of sleep disorders: (National Library of Medicine, 2010)

There are nearly 100 sleep disorders, which have been classified in to four general categories including dyssomniaas, parasomnias,sleep disorders associated with medical/psychiatric problems, and proposed sleep disorders.However, because of the large degree of syndrome overlapping among the categorie ,it may be more practical and convenient to classify sleep disorders according to the patient’s chief complaint. These would include

Insomnia

- Difficulty initiating sleep
- Difficulty with sleep minteance
- Early awakening

Hypersomnia

- Obtructive sleep apnea
- Central sleep apnea
- Narcolepsy
- Medication effects

Sleep/wake cycle disturbances

- Noctural leg movements
- Disorders of arousal
- Sleep-wake transition disorders
- REM sleep behavior disorders

Sleep and Aging: (Neubauer,2010)

Several generalizations can be made regarding aging and sleep characteristics. Compared with younger persons, elderly persons tend to achieve less total nighttime sleep. However, it cannot be assumed that elderly persons require less sleep. Elderly persons have more nighttime arousals and awakenings. Increased daytime sleepiness may be the effect of such a pattern. Overall, the sleep-wake cycle in the elderly may

be fragmented, with interrupted nighttime sleep and daytime wakefulness interrupted by naps. The deepest stages of non-REM sleep are frequently reduced or nonexistent in elderly persons; however, REM sleep tends to be preserved. Although a mild deterioration in sleep quality may be normal in the aging process, an elderly patient's complaint of significantly disrupted nighttime sleep or impaired daytime functioning because of excessive sleepiness must be evaluated.

Another common age-associated sleep change relates to the circadian rhythm of the typical sleep period. Although exceptions exist, elderly persons tend to go to sleep earlier in the evening and to awaken earlier in the morning. Early-morning awakening is a common complaint in the elderly. Some people find it annoying to awaken spontaneously at 4:30 a.m. instead of at 6:30 a.m. In these persons, if the onset of evening sleep is not correspondingly earlier, sleep deprivation and excessive daytime sleepiness may result.

Daytime napping may compound the problem by reducing the drive for sleep at the usual bedtime hour, resulting in delayed sleep onset and a further decrease in the duration of nighttime sleep.

Less common in elderly persons, but sometimes dramatic, is the development of a “night owl” pattern, with bedtime delayed until the early-morning hours. This sleep-wake cycle may have been tolerated in the younger years during employment, when the cues of early-morning bright light were stronger and the regularity of sleep-wake hours was become delayed by several hours. These patients may complain of day-night reversal, where sleep does not begin until dawn and then continues until mid-afternoon.

Causes (National Library of Medicine, 2010):

Sleep problems are common in the elderly. In general, older people need 30 to 60 minutes less sleep than younger. Their sleep is less deep and more choppy than sleep in younger people. A healthy 70 years old may wake up four times during night without it being due to disease. Some causes or contributions to sleep disturbances in older adult include

- Alzheimer's disease
- Chronic disease, such as congestive heart failure
- Depression
- Neurological conditions
- Pain caused by disease such as arthritis.
- Prescription drugs, recreational drugs or alcohol
- Sedentary life style
- Stimulants such as caffeine
- Urination at night.

Effects of lack of Sleep on the Elderly: (Farris, 2011)

Insomnia can become quickly chronic in an elderly person and when it does the life style can be critically affected.

- Lack of concentration can lead to accidents like leaving the doors unlocked.
- Increased clumsiness can lead to physical falls and other accidents.
- *Constant tiredness* can lead to auto accidents.
- Avoidance of symptoms can lead to clinical depression, which heightens sleep disturbance.

Sleep deprivation and sleep effects can have a serious effect on health. Inadequate rest impairs a person's ability to think, handle stress, maintain a healthy immune system and control emotions. Sleep disorder effects include mental and physical impairment.

Initial Side Effects:

Elderly if not getting enough sleep may feel drowsy during the day. They may become irritable, anxious, have extreme mood swings and difficulty concentration. The national sleep foundation reports that lack of sleep leads to problems completing a task, concentrating or making decisions as well as unsafe actions. Lack of sleep can cause people to doze of during the day, that affects the night sleep.

Additional Side Effects:

If sleep deprivations left untreated elderly may develop serious problems. According to the centers for disease control & prevention, chronic sleep deprivation can negatively impact the overall quality of life.The centers for disease control and prevention states that insomnia may contribute to chronic illnesses such as diabetes, cardiovascular disease and obesity. Without the right amount of sleep the body is not as efficient at carrying out daily task that keep one healthy. Additional signs that a

person not getting adequate sleep include apathy, slowed speech and impaired memory.

Sleep Problems in Elderly

Sleep problems in seniors may involve a number of factors such as decreased energy output as a result of retirement, the age of the person, then state of health and any prescription drugs they may be taking for health problems. Bereavement may be a contributing factor, the loss of a life time partner in the elderly person as cited by (Bachman, 1992) & more often can result in downward slide in health sleeping problems providing difficult to manage without out at least some form of short term medication. (Mied, 2003).

Illness disrupts sleeping patterns in the elderly, and may result in increased awakenings due to physical discomfort, caused by cramps, angina, chronic obstructive, away disease. The most frequently occurring sleep problem in the elderly s sleep latency, the person may spent some hours in bed before sleep occurs. The elderly person may view this as a problem and request sleeping pills, whereas, all that is needed is to reorganize their lives to cope with the changes in sleeping pattern they are experiencing. (Evans & Rogers, 1994).

Old age may bring lack of mental sharpness. This can occur because of physical disability, lack of security, especially if the old people can't take care of themselves financially, they have inability to concentrate, forget fullness, inability to consume, to hear, to see, day dreaming, some may have lack of motive to live. (Karacan & Williams, 1983).

In order to get rid of sleep problems elderly must understand the importance of sleep and the need for sleep. Sleep gives the body rest and allows to prepare for the next day. It's like giving a mint vocation. It also gives a chance to the brain to sort things out (Bioter et al, 1984).

Disturbed sleep with night time wondering is one of the most frequent reasons why elderly individuals are institutionalized sleep disturbances and related behaviors and complaints are common among nursing home populations.

Management of Sleep Problems in Elderly: (Rivero, 2010)

Management of sleep problems can be multistatergy, it includes

- **Health education**
- **Sleep hygiene education**
- **Psychological Therapies:**
  - Behavioural therapy
  - Cognitive behavioural therapy
  - Stimulus control therapy
  - Sleep restriction therapy
  - Relaxation therapy
  - Cognitive restructuring techniques
  - Paradoxical intention
- **Pharmacological Treatment:**
  - Hypnotics
  - Antidepressants
  - Clomethiazole
  - Barbiturates

- Antipsychotics
- Antihistamines
- Diphenylamine
- Hydoroxyzine
- Doxylamine
- Benzodiazepine receptor agonists

❖ **Other Treatments:**

- Melatonin
- Physical exercise
- Bright light therapy
- Acupuncture
- Herbal medicines
- Aromatherapy
- Massage therapy

Studies related to sleep and sleep problems in the elderly

A study on the prevalence of sleep problems was conducted by the National Institute on Aging, Bethesda by Simonsick, (2009). The frequencies of five common sleep complaints, trouble falling asleep, waking up, awaking too early, needing to nap and not feeling rested, were assessed in over 9,000 participants aged 65 years. Less than 20% of the participants in each community rarely or never had any complaints whereas over half reported at least one of these complaints as occurring most of the time. Between 23% and 34% had symptoms of insomnia, and between 7% and 15% rarely of never rested after waking up in the morning.In multivariate analyses, sleep complaints were associated with an increasing number of respiratory symptoms and

poorer self-perceived health.Sleep disturbances,particularly among older persons, oftentimes may be secondary to coexisting diseases.

A cross-sectional interview was conducted by Huang,(2009) in a total of 2045 non-institutionalized older individuals aged 65 years or above of an urban community to determine the prevalence of risk factors for self-reported sleep complaints in the elderly.

The prevalence of one-month insomnia was 6% overall with a higher rate in elderly women (8%) than men (4.5%). Frequent use of hypnotics over the past month was 8.4%. Among specific sleep complaints, poor sleep quality was the most commonly reported symptom, followed by difficulty falling asleep and difficulty maintaining sleep or early morning awakenings. Increasing age did not correlate with an increased rate of insomnia and female gender was not an independent risk factor. Factors associated with insomnia for both genders were nocturnal micturation (OR = 20.6) and regular use of hypnotics (OR = 3.2),pulmonary disease (OR = 2.7), not married (OR = 2.3), excessive daytime sleepiness (OR = 2.4), and mental illness (OR = 8.6) were risk factors for men while lack of education (OR = 1.8) and body pain (OR = 2.6) were risk factors for women. Depression (OR = 2.2) was strongly associated with insomnia in the elderly women as well.There was a low insomnia prevalence rate in the urban elderly community. Identified insomniacs required treatment of physical and mental problems, particularly in gender-specific risk factors. For those who complained of poor sleep quality symptom, early intervention may halt their progress of sleep disturbance and avoid unnecessary benzodiazepine use.

III. Effects of aerobic exercise in promoting sleep (Cited by McGuire Health and Wellness Centre)

The word aerobic literally means “with oxygen” or “in the presence” of oxygen. Aerobic activity trains the heart, lungs and cardio vascular system to process and deliver oxygen more quickly and efficiently to every part of the body. As the heart muscle becomes stronger and more efficient, a large amount of blood can be pumped with each heart heat. As a result, a fit individual can work longer, more vigorously and achieve a quicker recovery at the end of aerobic session.

Everyone's body temperature naturally goes up slightly in the daytime and back down at night. Decreasing body temperature seems to be a trigger, signaling the body that it's time to sleep. Vigorous exercise temporarily raises the body temperature as much as two degrees.

Twenty or 30 minutes of aerobic exercise is sufficient to keep the body temperature at this higher level for a period of four to five hours, after which it drops lower than if you hadn't exercised. This lower body temperature is what helps one sleep better. So if a person exercise five to six hours before going to bed, he will be attempting to sleep at the same time, the temperature is beginning to go down.

Exercise and sleep have a more complicated relationship than many people realize. The majority of people claim that they don't exercise on a regular basis because they are too tired. If there were a competition to determine which lifestyle habit would win the title of "best intention never acted on," exercise would probably win. The reason we intend to exercise is that we all know how good it is for us. And research finds new benefits every day. Regular exercise improves heart health and

blood pressure, builds bone and muscle, helps compact stress and muscle tension, and can even improve mood and sound sleep. Exercise can help one sleep sounder and longer and feel more awake during the day. It's true. But the key is found in the type of exercise choosen and the time one participate in it during the day.

Things to be kept in mind before starting aerobic exercise:

There are three factors that should be kept in mind before starting any kind of aerobics.

i. Frequency:

Most experts believe that 3-5 times per week of aerobic activity is fine.

ii. Duration:

20-60 minutes of an exercise is considered optimal.

iii. Intensity:

This refers to the percentage of the maximum heart rate at which one work. Experts believe that achieving 60-90% of age specific maximal heart rate should be the target of an aerobic session.

How to begin aerobic exercise:

Be careful not to start any kind of aerobic activity suddenly & vigorously. This is time when one is starting for the very first time. Sudden and intensive exercise can cause more harm than good. It can lead to muscle injuries and sprains.

A good idea is to start slowly and build up to a full program. Walking is the easiest way to begin a program. Start with a stroll for a mile or so and increase it by walking 3-4 miles per hour. As one feel more comfortable with walking a good distance, one might need to try another activity such as jogging, running or even

aerobic or step classes. The most important thing is to be able to do any kind of aerobic exercise regularly. (Mayo Foundation for Medical Education & Research)

Phases of Aerobic Exercise: (Voza, 2011)

Warm up Phase:

The function of warm up phase is to prepare the body for workout. Starting with upper and lower body muscles, the heart rate and respiration rate gradually increase from a resting phase to just below a target of training rate. Muscle contractions generate heat and increase the core temperature, warming up the muscles and increasing the metabolism, or calorie burning ability. Gentle stretches increase the range of motion in preparation for the next phase. The warm up phase should last between 5-10 minutes.

Training Phase:

During the training phase, the heart rate reaches and remains in the target heart rate. While in this zone, the heart and lungs work harder to meet the increased intensity demand. The body moves continuously, incorporating low to high impact movements utilizing large group muscle group, running, jumping shuffling are examples of movements in the training phase. Arm movements are included to further increase exercise intensity. This phase should last between 15 to 25 minutes.

Cool-Down Phase:

Like the warm up phase, the cool-down phase involves gradually changing the heart rate and respiration, but in reverse from a training rate back to a resting or recovery rate. The blood is re-circulated evenly throughout the body in order to prevent blood pooling in the laser extremities. Deeper stretching enables recovery

and prevents excessive soreness and the risk injury, the body returns to a relaxed state and should feel energized from the workout.

Benefits of Aerobic Exercise: (Muller, 2011)

Aerobic exercise helps the body release stresses which can interfere with sleep. Engaging in some form of aerobic exercise, such as walking, running or bicycling for at least 30 minutes three times a week will improve the ability to fall asleep.

Physical health benefits of elderly:

- **Exercise helps seniors maintain or lose weight.** As metabolism naturally slows with age, maintaining a healthy weight is a challenge. Exercise helps increase metabolism and builds muscle mass, helping to burn more calories. When your body reaches a healthy weight, overall wellness improves.
- **Exercise reduces the impact of illness and chronic disease.** Among the many benefits of exercise for seniors include improved immune function, better heart health and blood pressure, better bone density, and better digestive functioning. Seniors who exercise also have a lowered risk of several chronic conditions including Alzheimer's disease, diabetes, obesity, heart disease, osteoporosis, and colon cancer.
- **Exercise enhances mobility, flexibility, and balance in seniors.** Exercise improves your strength, flexibility and posture, which in turn will help with balance, coordination, and reducing the risk of falls. Strength training also helps alleviate the symptoms of chronic conditions such as arthritis.

Mental health benefits of elderly:

- **Exercise improves your sleep.** Poor sleep is *not* an automatic consequence of aging and quality sleep is important for your overall health. Exercise often improves sleep, helping you fall asleep more quickly and sleep more deeply.
- **Exercise boosts mood and self-confidence.** Endorphins produced by exercise can actually help you feel better and reduce feelings of sadness or depression. Being active and feeling strong naturally helps you feel more self confident and sure of yourself.
- **Exercise is good for the brain.** Exercise benefits regular brain functions and can help keep the brain active, which can prevent memory loss, cognitive decline, and dementia. Exercise may even help slow the progression of brain disorders such as Alzheimer's disease.

Studies related to Aerobic exercise in promoting sleep in the elderly:

By improving a person's sleep, you can improve their physical and mental health, Zee Said, "Sleep is a barometer of health, like someone's temperature. It should be the fifth vital sign. If a person says he or she isn't sleeping well, we know they are more likely to be in poor health with problems like hypertension or diabetes mellitus.

Zee, M.D, Director of the Sleep Disorders Centre at North Western Medicine in September 2010 conducted a study which included 23 sedentary adults. The study is the first to examine the effect of aerobic exercise on middle aged and older adults with a diagnosis of insomnia. About 50 percent of people in these age groups complain of chronic insomnia symptoms. The study included 23 sedentary adults primarily women, 55 and older who had difficulty falling sleep and or staying asleep

and impaired daytime functioning. Women have the highest prevalence of insomnia. After a conditioning period, the aerobic activity group exercised for two 20 minutes sessions four times per week or one 30 to 40 minute session four times per week, both for 16 weeks. Participants worked at 75% percent of their maximum heart rate on at least two activities including walking or using stationary bicycle or treadmill. Participants in the non-physical activity group participated in recreational or educational activities such as cooking class or a museum lecture, which met for about 45 minutes three to five times per week for 16 weeks. Both groups received education about good sleep hygiene, which includes sleeping in a cool, dark & quiet room, going to bed the same time every night and not staying in bed too long if you can't fall asleep. Exercise improved the participants self-reported sleep quality, elevating them from a poor sleeper to good sleeper. They also reported feeling better, their moods improved and had more vitality and less daytime sleepiness.

An acute session of moderate aerobic exercise, but not heavy aerobic or moderate strength exercises, can reduce the anxiety state and improve the sleep quality of insomnia patients. The study is authorised by Passos (2008) of Federal University of Sao Paulo in Brazil, focused on 36 patients (8 men and 28 women) with primary chronic insomnia, who were divided in to three experimental groups (moderate aerobic exercise, heavy aerobic exercise and moderate strength exercise) and a control group.

According to the results, after the exercise session, reductions were shown in sleep onset latency (54%) and wake time (36%) in the moderate aerobic exercise group, while increases were shown in total sleep time (21%) and in sleep efficiency (18%) . A significant increase in total sleep time (37%) and reduction in the sleep

onset (40%) were observed in the sleep log of volunteers of the moderate exercise group. Finally a significant reduction (75%) percent in the anxiety state was also observed after moderate aerobic exercise session.

These findings indicate that there is a way to diminish the symptoms of insomnia without using medication said Passos. This study is first to look at the importance of using physical exercise to treat insomnia and may contribute to increased quality of life in people with one of most important kind of sleep disorders around the world.

A study was conducted by Kathryn, (2010) to assess the efficacy of moderate aerobic physical activity with sleep hygiene education to improve sleep, mood, and quality of life in older adults with chronic insomnia, Seventeen sedentary adults aged > 55 years with insomnia (mean age 61.6 (SD±4.3) years; 16 female) participated in a randomized controlled trial comparing 16 weeks of aerobic physical activity plus sleep hygiene to non-physical activity plus sleep hygiene. Eligibility included insomnia for at least 3 months, habitual sleep duration < 6.5h and a Pittsburgh Sleep Quality Index (PSQ1)score>5. Outcome included sleep quality, mood and quality of life questionnaires. (PSQ1, Epworth Sleepiness Scale [ESS], short form 36 [SF-36], center for Epidemiological studies depression scale [CES-D]).

The physical activity group improved in sleep quality on the global PSQ1 ($p<0.00$), sleep latency ($p=.049$), sleep duration ($p=0.04$), daytime dysfunction ($p=0.027$) and sleep efficiency ($p=0.36$), PSQ1 sub-scores compared to the control group. The physical activity group also had reduction in depressive symptoms ($p=0.044$), daytime sleepiness ($p=0.02$) and improvements in vitality ($p=0.017$) compared to baseline scores. Aerobic physical activity with sleep hygiene education

is an effective treatment approach to improve sleep quality, mood and quality of life in older adults with chronic insomnia.

New research presented at the 22nd annual meeting of the Associated Professional Sleep Societies (APSS) by Marten, (2008) shows that an acute session of moderate aerobic exercise, but not heavy aerobic or moderate strength exercises can improve the amount and quality of sleep for people with insomnia without resorting to pharmaceutical sleep-aids. What exactly does "acute" mean in this context. Merriam-Webster defines acute as "having a sudden onset, sharp rise, and short course", so moderate but not heavy, aerobic exercise is like a brisk 20-30 minute walk. In this new research, 36 patients, all with primary chronic insomnia, were divided into four groups.

- Moderate aerobic exercise (e.g) walking
- Intense aerobic exercise (e.g) running
- Moderate strength exercise (e.g) Pilates
- A control group (no exercise)

Of the above 4 groups, the moderate aerobic exercise group (exercise walking) showed the most sleep improvements.

- 54% reduction in time it takes to fall asleep
- 36% less awake time during night
- 37% increase in total sleep time.

These findings highlight the importance of moderate physical exercise to help treat insomnia. In general about 30 percent of adults are thought to have symptoms of

insomnia. It is more common among elderly people, women, and those suffering from a pain condition.

This study was conducted by King, Oman, Brassigton, Bliwise & Haskell, (2010) conducted a study to determine the effects of moderate intensity exercise training on self-rated (subjective) sleep quality among healthy, sedentary older adults reporting moderate sleep complaints in the general community. Volunteer sample of 29 women and 14 men (of 67 eligible subjects) aged 50 to 76 years who were sedentary, free of cardiovascular disease, and reported moderate sleep complaints were included. The samples were randomized to 6 weeks duration. Exercise was provided which consisted primarily of four 30-40 minute endurance training sessions (low impact aerobics, brisk walking).Compared with control group subjects, subjects in the exercise training conditions showed significant improvement in PSQI global sleep score at 6 weeks baseline and post test values in mean (SD) for C=8.93 (3.1) and 8.8 (2.6) baseline and post test values in mean (SD) for C=8.93 [3.1] and 8.8 [2.6] baseline and post test values for E=8.7 [3.0] and 5.4 [2.8], mean post test difference between conditions = 3.4, P<.001, 95% confidence interval, 1.9-5.4, as well as in the sleep parameters of related sleep quality, sleep onset latency (baseline and post test values for control group = 26.1 [21.0] and 23.8 [15.3], for experimental group = 28.4 [20.2] and 14.6 [13.0] net improvement = 11.5 minutes) and sleep duration baseline and post test scores for control group = 5.8 [1.1] and 6.0 [1.0], for experimental group 6.0 [1.1] and 6.8 [1.2] net improvement = 42 minutes assessed via PSQ1 and sleep diaries (P=0.05). Older adults with moderate sleep complaints can improve self rated sleep quality by initiating a regular moderate intensity exercise program.

Regular aerobic exercise improves the quality of sleep mood and vitality according to a new study by Ians (2011). The study is first to examine the effects of aerobic exercise on middle aged and older adults with a diagnosis of insomnia. The aerobic exercise trial resulted in the most dramatic improvement which reported good quality of sleep, including sleep duration, compared to any pharmacological intervention.

A study was conducted by Stevensons & Topp (2003) to determine the existence of differential effects of long term moderate or low intensity exercise on selected bio- behavioral variables in 72 community dwelling persons over 60 years of age. After screening, subjects were randomly assigned to a moderate (n=39, 60-70% Heart Rate Reserve) or low (n=33, 30-40% HRR) intensity exercise protocol. Both groups exercised three times per week for 9 months and dependent measures were taken at baseline, 4-5 months and after 9 months. Repeated measures ANOVA with Turkey post hoc comparisons constituted the analysis approach. Moderate exercise showed no superiority over low intensity exercise; both groups improved about equally. Variables that significantly improved included: self reported sleep, mental status, attention, concentration, short term memory, and higher cognitive functioning, health perceptions (health outlook, health worry, rejection of the sick role),cardio vascular fitness indicators (sub maximum stress test heart rate, maximum oxygen consumption (VO2max), maximum work capacity exercise time). Similarity of outcomes in both groups may mean that the moderate exercise protocol was too conservative. Conversely, the finding will indicate that lower levels of exercise, which may be safer and more feasible over time, do improve fitness levels, prolong independent functioning, and promote positive perceptions of well - being in older adults.

IV. Effects of aromatherapy in improving sleep

Aromatherapy is the practice of using the natural oils extracted from flowers, bark, stems, leaves roots or other parts of a plant to enhance psychological & physical well being. The inhaled aroma oil from these essential oils is widely believed to stimulate brain function. Essential oils can be absorbed through the skin, where they travel through the blood stream and can promote whole body healing. A form of alternative medicine, aromatherapy is gaining momentum. It is used for a variety of applications, including pain relief, mood enhancement, and increased cognitive functions. (Carson, 2006).

History:

Essential oils have been used for therapeutic purposes for nearly 6000 years. The ancient Chinese, Indians, Egyptians, Greeks, and Romans used them in cosmetics perfumes and drugs. Essential oils were also commonly used for spiritual, therapeutic, hygienic, and ritualistic purposes.

More recently, Rene Maurice Gattefossi a French chemist discovered the healing properties of lavender oil when he applied it to a burn on his hand caused by an explosion in his laboratory. He then started to analyze the chemical properties of essential oils and how they were used to treat burns, skin infections, gangrene, and wounds in soldiers during world war. By 1950s, massage therapists, beauticians, nurses, physiotherapist, doctors, and other health care providers began using aromatherapy (Wpdesigner, 2009).

Available Forms:

- Aromatherapy oil
- Bath gels
- Extracts
- Infusions
- Lotions
- Soaps
- Tees
- Tinctures
- Whole dried flowers

Lavender Oil & Sleep:

Lavender essential oil can be used in a variety of ways to promote a deeper, more relaxed sleep. Essential oils can be used in teas, in baths or massaged on to the skin, Lavender essential oil used in a hot bath relaxes the body but the scent also promotes sleepiness. Lavender essential oil is one of the most popular and most versatile of all. Lavender oil has a soothing and calming effect on the nerves, relieving tension, depression, panic, hysteria and nervous exhaustion in general and is effective for headaches migranes & insomnia (Ehrlich, 2009).

How does aromatherapy work:

Researchers are not entirely clear how aromatherapy may work. Some experts believe the sense of smell may play a role.The "smell" receptors in the nose communicate with parts of the brain that serve as store houses for emotions & memories. When one breathe in essential oil molecules, some researchers believe that

they stimulate these parts of the brain and influence, physical, emotional & mental health.

Benefits of Aromatherapy: (Hofstetler, 2009)

- Improve sleep
- Relieve stress
- Relieve anxiety
- Relieve postpartum discomfort
- Heals colds
- Makes one more alert
- Relieve pain
- Relieve anxiety & fear
- Constipation
- Agitation
- Alopecia
- Skin care

Side Effects & Warnings:

Essential oils can be toxic when taken internally, producing unpleasant and even fatal effects. Infants, children, seniors, and people with severe illnesses should not use essential oils internally except under supervision of a physician. Some essential oil when applied to skin raise the risk of skin cancer. (Alter, 2002)

Studies Related to effectiveness of lavender oil in promoting sleep in the elderly:

Dr. Raudenbush (2008) conducted a study where the bed rooms of nursing home perfumed with the scent of lavender induced sleep in the elderly residents with insomnia comparable to sleeping pills. The residents slept better than they did when

they were neither given sleeping pills nor exposed to lavender fragrance. This showed that lavender induced better quality deep sleep than sleeping pills. Besides sleeping longer and better, participants who sleep with the scent of lavender felt more rested, energetic and alert next morning.

A study was conducted by New Research Psychologist at Wesleyan University, where 31 men and women sniffed lavender essential oil one night and then distilled water the next four 2 minute period first before bed time. The researcher's monitored, their sleep cycles with brain scans. On the night they whifted the herb, subjects slept more soundly; they also felt, more energetic in the next morning. The researchers found that laventor increases slow wave sleep, the very deep slumber in which the heart rate slows and muscle relaxes.(As cited by Atshul, 2006).

Sabelian (2005) conducted a study to evaluate the proposed trial methodology and the efficacy of lavendula augastifolia on insomnia. Interventions consisted of lavender treatment and sweet almond oil as placebo control. Ten, 5 male & 5 female were entered and completed the 4 week study lavender created an improvement 2-5 point in PSQI.

In one study done at Britain's University of Southampton, researchers tracked the sleep patterns of 10 adults. For a week, half of the participants slept in a room where 31 men and women sniffed laventor essential oil one night and then distilled water the next four 2 minute period first before bedtime. The researcher's monitored their sleep cycles with brain scans. The results were, the subjects slept more soundly, they also felt more energetic in the next day morning.(As cited by Atshul, 2006)

A study was conducted by Hudson (1996) investigated the potential of essential oil of lavender to aid rest and relaxation and thereby encourage the healing process in elderly patients. The patients were monitored for seven days during which time their sleep patterns, dozing & alertness during the day were recorded. The following seven days, one drop of lavender augusfolia was put on each patient's pillow at night. No other changes were made in the patient's daily routine or medications that they were receiving.

At the end of seven days, all of the patient's records were collected and analyzed. Interestingly all of the patients reacted favorably to the treament; the researcher observed increased day time alertness, improved sleep patterns and those patients who had previously experienced confusion were observed to display as much as a 50% decrease in their symptoms.

V. Teaching on Sleep Hygiene in promoting sleep quality

Importance of Sleep Hygiene

Sleep hygiene is important, for everyone from child hood through adult hood. A good sleep hygiene routine promotes healthy sleep and day time alertness. Good sleep hygiene practices can prevent the development of sleep problems & disorders (Heijden, 2008).

Good sleep hygiene measures (Cited by National Sleep Foundation):

The most important sleep hygiene measure is to maintain a regular sleep and wake pattern seven days a week. It is also important to spend an appropriate amount of time in bed, not too little, or too excessive. This may vary by individual; for example, if someone has a problem with daytime sleepiness, they should spend a minimum of eight hours in bed, if they have difficulty sleeping at night, they should

limit themselves to 7 hours in bed in order to keep the sleep pattern consolidated. In addition, good sleep hygiene practices include:

- Avoid napping during the day; it can disturb the normal pattern of sleep and wakefulness.
- Avoid stimulants such as caffeine, nicotine, and alcohol too close to bedtime. While alcohol is well known to speed the onset of sleep, it disrupts sleep in the second half as the body begins to metabolize the alcohol, causing arousal.
- Exercise can promote good sleep. Vigorous exercise should be taken in the morning or late afternoon. A relaxing exercise, like yoga, can be done before bed to help initiate a restful night's sleep.
- Food can be disruptive right before sleep; stay away from large meals close to bedtime. Also dietary changes can cause sleep problems, if someone is struggling with a sleep problem, it's not a good time to start experimenting with spicy dishes. And, remember, chocolate has caffeine.
- Ensure adequate exposure to natural light. This is particularly important for older people who may not venture outside as frequently as children and adults. Light exposure helps maintain a healthy sleep-wake cycle.
- Establish a regular relaxing bedtime routine. Try to avoid emotionally upsetting conversations and activities before trying to go to sleep. Don't dwell on, or bring your problems to bed.
- Associate your bed with sleep. It's not a good idea to use your bed to watch TV, listen to the radio, or read.
- Make sure that the sleep environment is pleasant and relaxing. The bed should be comfortable, the room should not be too hot or cold, or too bright.

Studies related to sleep hygiene in promoting sleep in the elderly:

Disturbed sleep can affect personal wellbeing and impede the rehabilitation and recovery of older people from illness. This paper reports the findings of a pilot study which included examination of sleep quality and sleep patterns of older people in community hospital and nursing home settings conducted by Ersser, Wiles, Wade, Walsh & Bentle (2007).A marked proportion of older people reported sleeping well in nursing care settings, and those in nursing home slept better than those in the community hospital. The main causes of sleep disturbances in both settings were: needing to go to toilet, noise, pain, and discomfort; a similar pattern was seen across the different settings. No discernible difference was found in quality of sleep and whether patients felt rested or not between those patients on hypnotic medication and those who were not.

A study was conducted by Yoon, Schnelle, Samarrai & Cruise (2004) and the purpose of the study was to test whether an intervention combining increased daytime physical activity with improvement in the nighttime environment improves sleep and decreases agitation in nursing home residents. A randomized controlled trial on a community nursing home where 29 incontinent residents (mean age 88.3 years, 90% female).Subjects were randomized to receive either an intervention combining increased daytime physical activity(14 weeks in duration) plus a nighttime program (5 nights in duration) to decrease noise and sleep-disruptive nursing care practices. (Daytime physical activity monitors and structured physical function assessments; nighttime wrist activity monitors to estimate nighttime sleep; and timed daytime behavioural observations of sleep versus wakefulness, either in or out of bed and agitation were measured)

Physical findings measures did not change significantly (Manova for repeated measures, group by time effect).Wrist actinography estimation of nighttime percent sleep(time asleep overtime monitored in bed at night) increased in intervention subject from 51.71% at baseline to 62.5% at follow up compared with 67.0% at baseline to 66.3% at follow up in controls (Manova, group by time, F=4.42, P=.045,df=27). Seven of 15 interventions subjects had a decrease in observed agitation at follow up, intervention subjects averaged a 32% decrease in the percent of daytime observations in bed compared with baseline, with essentially no change in controls (manova, group by time, F=5.31, p=.029, df=27). Seven of 15 intervention subjects had a decrease in observed agitation. This study provides preliminary evidence that an intervention combining increased physical activity with improvement in the nighttime nursing home environment improves sleep and decreases agitation in nursing home residents.

Studies published on the efficacy of sleep hygiene measures agree that by themselves these measures are unable to resolve chronic insomnia their effectiveness in the treatment of acute insomnia. There is also no, information on their effectiveness in the treatment of acute insomnia. In fact most of the time these measures were used in studies as an adjunct to other therapeutic intervention.[In Rivero'(2009) as cited in Autorite (2006), Alberta (2007), Rogiers, Declerq and Habraken (2005), Morgenthala, Kramer & Alessi, (2006) Morin, Bootzin & Buysse, (2006). They are included in the majority of treatment, despite their impact on sleep being minimum when used as the only interventions (In Rivero'(2009) as cited in Morgenthala, Kramer & Alessi,(2006) Morin, Bootzin & Buysse (2006)]. There are studies that compared sleep hygiene as monotherapy with a combination therapy. Sleep hygiene plus stimulus control or plus more relaxation or move sleep restriction

showed that combination therapy to be more efficient. [“Declercq, Rogers & Habraken (2005); Wang & Tsai, (2005).]

Sleep hygiene measures are often used as an adjunct to other therapeutic interventions(Rivero’ (2009) as cited in Autorite (2006), Alberta(2007), Declercq, Rogiers & Habraken (2005),Morin, Bootzin & Buysee (2006). A combination therapy of sleep hygiene plus stimulus control, more relaxation or more sleep restriction has better results in terms of sleep efficiency than sleep hygiene as monotherapy. (Declarcq, Rogiers & Habraken (2005) Wang & Tsai (2005).

CHAPTER – III

RESEARCH METHODOLOGY

The methodology of research indicates the general pattern of organizing the procedure for gathering valid and reliable data for investigation. This chapter provides a brief description of the toll, pilot study, data collection procedure research approach, research design, settings, sample size, sampling technique, description of the toll, pilot study, data collection procedure and plan for data analysis.

Research Approach:

An experimental approach was adopted for this study. Experimental approach is a scientific investigation in which observations are made and data are collected according to a set of well defined criteria.

Research Design:

Quasi experimental design with non equivalent pre test and post test control group design was adopted for this study.

Group	Pre Test	Intervention	Post Test
Experimental Group (E)	O_1	X	O_2
Control Group (C)	O_1	-	O_2

O_1 - Pretest level of sleep quality & day time sleepiness

O_2 - Post test level of sleep quality & sleep intervention

X - Sleep intervention strategies (aerobic exercise, structured teaching on sleep hygiene, aromatherapy)

Variables:

Dependent variable - Sleep quality & day time sleepiness

Independent variable - Sleep intervention strategies

Settings of the Study:

The study was conducted in two old age homes in and around Madurai. The two old age homes are namely Inba Illam at Pasumalai and Siva Linga Nadar Old age home at Tiruparangkuntram. They are located at a distance of 15-18 km respectively from Sacred Heart Nursing College.

Description:

1. Inba Illam old age home, Pasumalai.

The home has a total of 50 elderly, 30 females and 20 males. The home has shared accommodation for the inmates. It provides medical & accommodation facilities & recreation facilities (TV) at free of cost.

2. Sivalinga Nadar old age home at Thiruparanguntram

The home has a total of 35 Inmates, 17 females and 18 males. The home has single rooms for each inmates. It provides medical, accommodation facilities and recreation facilities.

Study Population:

The target population of the study were the elderly residing in selected old age homes at Madurai.

Sample:

Elderly people who fulfilled the inclusion criteria.

Sample Size:

Sample sizes were 30 elderly with sleep problems in experimental group and 30 elderly with sleep problems in control group.

Sampling Technique:

Purposive sampling technique was used for this study.

Criteria for Sample Selection:

The samples are selected based on the following criteria

Inclusion Criteria:

1. Elderly people who had sleep disturbances aged between 60-80 years.
2. Elderly people who can understand Tamil or English
3. Elderly who were willing to participate

Exclusive Criteria:

1. Elderly with history of psychiatric illness
2. Elderly who were on sedatives
3. Elderly who had anosmia
4. Elderly who were bedridden.

5.Elderly who had difficulty with walking.

6. Elderly who used walking aids

7.Elderly with cardiovascular diseases.

Research Tool & Technique:

The tool used for data collection had 3 sections.

Section A: Demographic Variables.

The demographic characteristics included for the study were age, sex, religion, education martial status and leisure time activity.

Section B:

Pittsburgh Sleep Quality Index is a self report instrument that measures subjective sleep quality (Buvsso, 1989). The Pittsburgh Sleep Quality Index scale has been reported to be useful in the screen of the total sleep quality of elderly population. This instrument contains 9 self-report items and seven component scores, each scored from 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score range 0 to 21. Higher scores indicate worse sleep quality.

Interpretation of the Score:

- A total score of >5 indicates poor sleeper
- A total score of <5 indicates good sleeper

Component	Question	Measurement
Subjective sleep quality	Question 9	Question 9
Sleep latency	Question 2 and 5a	Q2+ Q5a
Sleep duration	Question 4	Q4
Sleep efficiency	Question 1,3,4	Q4/Q1+Q5X100
Sleep disturbance	Q5b – 5i	Sum of Q5b-5i
Use of sleep medication	Q6	Q6
Day time dysfunctions	Q7	Q7 +Q8

Section C:

The Epworth Daytime Sleepiness scale was developed by (Murre and Johns in the yesr 1990). The original Epworth Day time Sleepiness was modified after pilot study. 2 questions were found irrelevant for the group and were deleted after pilot study. Modified Epworth Day time Sleepiness scale consisted of 6 questions where

the score ranged from 0 to 3 and it measures the elderly's chance to doze in 6 specific situation. Each question was scored as bellows:

0	Would never doze
1	Height chance of dozing
2	Moderate chance of dozing
3	High chance of dozing

Scoring Procedure:

Possible score ranges from 0-18. A higher score indicates greater day time sleepiness.

Interpretation of the Score:

0-4 - Normal range

5-10 - Borderline daytime sleepiness

11-18 - Abnormal daytime sleepiness

Testing of the Tool:

Validity:

Validity refers to the degree with which an instrument measures what it is supposed to be measuring (Polit & Hungler 2001) The tool was translated into Tamil and retranslated into English by language experts. The validity of the tool was established by five experts one from the medical field a, physician and 4 experts from the nursing field. Based on their suggestions the tool was modified.

Reliability:

Pittsburgh Sleep Quality scale demonstrated a good reliability of 0.91 on the test retest method.

Epworth Daytime Sleepiness scale demonstrated a good reliability of 0.97 on the test retest method.

Intervention:

The intervention for the present study was framed after wide literature review and experts opinion and the intervention was named as “sleep intervention strategies”.

Sleeping intervention strategies for the present study consisted of the following.

1. Structured teaching on sleep hygiene habits
2. Aerobic exercises
3. Aromatherapy

1. Structured Teaching on Sleep Hygiene Habits:

Definition:

Teaching on Sleep Hygiene

In this study teaching on sleep hygiene refers to the face to face group interaction in which the investigator provides information regarding sleep physiology,prevalence of sleep problems,healthy bedtime rituals,behavioural practices and environmental conditions, that could be delivered in a single group session(10 in each group; a total of three group) for a duration of 45- minutes to 1 hour using flash cards.

Aim:

1. At the end of the session, the elderly people will be able to describe the sleep physiology and sleep hygiene concepts in an effective manner.
2. Discuss age specific issues necessary in understanding the magnitude of the burden of sleep problems.

3. Preview the modifiable risk factors which can be reduced or eliminated through an educated effort to improve sleep in a population perspective.

Teaching Method:

Lecture cum discussion.

Teaching Content:

Sleep hygiene habits

Group: 3 groups; each group had 10 members each.

Duration: 45 minutes

Total number of session: 1

Teaching content:

i. Sleep Physiology:

Sleep occurs due to activity of some sleep inducing centers in brain. Stimulation of these centers induces sleep. Damage of sleep centers results in sleepiness or persistent wakefulness causing insomnia.

Sleep Centers:

Brain stem, diencephalon and cerebral cortex are involved in the onset and maintenance of sleep, two centers are located in brain stem

1. Raphe nucleus
2. Locus ceruleus of pons

Raphe Nucleus:

It is situated in lower pons and medulla. Activation of this nucleus results in non REM sleep. It is due to release of serotonin by the nerve fibers arising from the nucleus, serotonin induces non – REM sleep. Rapid eye moment refers to rapid

conjugate movement of the eye balls occur frequently during sleep, dreams occur during this period, it occupies about 20% to 30% of sleeping period.

Non Rapid eye movement sleep (NREM):

It is known as slow wave sleep. Dreams do not occupy in this type of sleep & it occupies about 70% to 80% of total sleeping period. The non REM sleep is followed by REM sleep.

Role of Locus ceruleus of Pons:

Activation of this centre produces REM sleep. Non adrenaline released by the serve fibers arising from locus ceruleus induces REM sleep.

Inhibition of Ascending Reticular Activating System (ARAS):

It is responsible for wakefulness because of the afferent and efferent connections with cerebral cortex. The inhibition of ARAS induces sleep. The lesions of ARAS leads to permanent somnolence.

ii. Statistics:

About 81 percent of the elderly have sleep problems, the procedure of chronic sleep complaints included difficulty in initiating or maintaining sleep (43%) noctural walking (30%) insomnia (29%) day time napping (25%) trouble falling asleep (19%) walking too early (19%) and walking not rested (13%) ***Roepke (2001).***

iii. Sleep Problems:

Lack of sleep results in excessive daytime sleepiness. In addition causes other conditions like, severe hypothyroidism, hypoxia, hypercapnia.

Sleep apnea causes loud snoring with transient, brief, intermittent breathing cessation, lasting greater than 10 seconds and also causes depression, headaches, memory loss and cognitive impairment.

Parasomnias are strange unusual behavior which occur sleep, during sleep, this include night mares, sleep talking, sleep walking.

Restless by syndrome is a relatively common problem in the elderly. Elderly often describe a great discomfort or are ping sensation occurring deep within the legs.

IV.Effects of lack of Sleep on the Elderly: (Farris, 2011)

Insomnia can become quickly chronic in an elderly person and when it does the life style can be critically affected.

- Lack of concentration can lead to accidents like leaving the doors unlocked.
- Increased clumsiness can lead to physical falls and other accidents.
- Constant tiredness can lead to auto accidents.
- Avoidance of symptoms can lead to clinical depression, which heightens sleep disturbance.

Sleep deprivation and sleep effects can have a serious effect on health. Inadequate rest impairs a person's ability to think, handle stress, maintain a healthy immune system and control emotions. Sleep disorder effects include mental and physical impairment.

Initial Side Effects:

Elderly if not getting enough sleep may feel drowsy during the day. They may become irritable, anxious, have extreme mood swings and difficulty concentration. The national sleep foundation reports that lack of sleep leads to problems completing

a task, concentrating or making decisions as well as unsafe actions. Lack of sleep can cause people to doze of during the day, that affects the night sleep.

Additional Side Effects:

If sleep deprivations left untreated elderly may develop serious problems. According to the centers for disease control & prevention, chronic sleep deprivation can negatively impact the overall quality of life.The centers for disease control and prevention states that insomnia may contribute to chronic illnesses such as diabetes, cardiovascular disease and obesity. Without the right amount of sleep the body is not as efficient at carrying out daily task that keep one healthy. Additional signs that a person not getting adequate sleep include apathy, slowed speech and impaired memory.

Teaching on Sleep Hygiene:

Teaching on sleep hygiene includes bedtime behavioural practices and environmental condition that aids in sleep.They are as follows:

- Keep the sleeping room cool.

  Aim: Wearing the temperature helps the body cool down, which can help to trigger sleep onset.

- Keep the sleeping room dark.

  Aim: Light is the most powerful time use for humans, even the low ambient light such as that of night light, which is a light sensitive organ that detects light even if eyes are closed.

- Keep the sleeping room quiet, use a fan air cleaner, or other source of white noise to drown out discernable noise.

  Aim: To prevent the disturbance of sleep by noise.

- If one cannot get to sleep after quietly lying in bed for 30 minutes, get out of the bed and engage in a quiet activity like reading or listening to soothing music, once after feeling tired, return to the bed and try to fall asleep again.

  Aim: This further interrupts the sleep pattern.

- Mattress should be a smooth, intact comfortable surface. It should not feel bumpy and the coils should not be protruding out.

  Aim: A properly selected mattress provides positive resistance to the sleeper's body weight.

- A mattress that is too firm will not provide even body support, tending instead to support only at the body's heaviest parts.

  Aim: This causes pressure that reduces blood circulation, causing the sleeper to toss and turn.

- A mattress that is too soft will not keep the spine in proper alignment with the rest of the body.

  Aim: The muscles will work throughout the night straightens the spine, leading to aches & pain in the morning.

- Use natural, non treated cotton or silk sheets.

  Aim: To avoid "permanent press" sheets as these are treated with chemicals.

- Do not allow pets, in to the sleeping room.

  Aim: Pet allergies can contribute to problems of breathing during sleep.

- Avoid electric clocks and clock radios in sleeping room.

  Aim: To prevent unnecessary noise.

- Avoid foods or drink that contain caffeine.

Aim: This will disturb the sleep.

- Do not bring worries to bed.

  Aim: This alters the sleep process.

- Do not go to bed hungry & advice not to have a big meal before bed time.

  Aim: Too hungry and bid meal will alter the sleep pattern.

- Take a hot bath 90 minutes before bed time.

  Aim: A hot bath will raise your body temperature, but it is the drop in body temperature, that may leave one feel sleepy.

- Avoid in appropriate substances that interfere with sleep e.g. cigarettes, alcohol, and over the counter medications.

  Aim: This may cause fragmented sleep.

- Advice to take a cup of milk before bed time.

  Aim: To promote sleep

- A few drops of jasmine or lavender oil on tissue will be placed near the bed.

- Get up same time every day even on week ends.

- National Sleep Foundation

Aerobic exercise

In in study aerobic exercises refers to the physical activity like walking and strength exercises which will be taught and the elderly in the experimental group will be encouraged to participate in groups, (30 members 10 in each group) for 4 times a week. (Monday, Wednesday, Thursday and Saturday) for a duration of 30 minutes each for 5 consecutive weeks.

Phase I:

Warm Up: (7-10 mts)

The elderly was encouraged to do slow jogging and walking 7-10 minutes.

Phase II:

Training Phase: (20-30 mts)

The elderly was demonstrated and encouraged to do the following exercises.

Arm strengthening exercises

i. Biceps:

1. Extend the right arm infront of the body with the palm facing up.
2. Take the fingers of right hand with left hand and gently stretch the finger right back and to your body.
3. Hold the position for 15 seconds and repeat on the other side repeat the exercise for 10 times.

ii. Triceps:

1. Lower the chin to the chest and place the right arm over the head with palms facing forward. Now the palm look inward
2. Bring the left arm above the head and left hands grabs the right first below the elbows. Gently pad the right arm to the left.
3. Hold the position for 15 seconds repeat on the other side and repeat for 10 times

a.Neck Mobility:

i. Flexion / Extension:

Tuck your chin in to your chest, and then lift your chin upward as for as possible. Repeat for six to 10 repetitions.

ii. Rotation:

Turn your chin laterally toward your left shoulder and then rotate it toward your right shoulder to six to 10 repetitions.

Chair Squats:

Begin by sitting in the chair lean slightly forward and stand up from the chain, try not to favour one side or your hands to help you.

Back rotation:

Begin by sitting in the chair, extend the legs of one side on the floor and keep the hand of the same over the thigh and bend forward and repeat the same on the other side to six to 10 repetitions.

Leg extension:

Sit upright, lift the left leg of the floor and extend it fully, lower it very slowly. Suggest repetitions 8-10 each leg.

Walking Exercise:

1. Walking exercise include aerobic workout and strength training.
2. Aerobic work out means, walking forward, backward, and from side to side. A 20 minute exercise is equivalent to 5 miles of walking.
3. Strength training means brisk walking.

Phase III Cool down: (7 minutes)

Cool down means gradually lowering the intensity of the chosen exercise. Gradual slowing down of the pace and exertion of the activity over several minutes can seem a natural progression. Slow walking will be encouraged. Through all these phases positive verbal reinforcement will be given.

Aromatherapy:

Definition:

In this study aroma therapy refers to the dilution of lavender oil 12 drops in 60 ml of carrier vegetable oil; and the 3 drops of this mixture is applied on to a tissue

and left near the bedside or the elderly with sleep problems every night before bedtime for 5 consecuitive weeks.

Aim:

1. Improves mood and general feeling of well being
2. Reduce pain and encourages restful sleep.

Method:

Before bed time, 3 drops of lavender oil will be dropped in a tissue and kept near the pillow before bed time. This procedure will be done everyday for 5 weeks. Since this procedure was performed before bedtime, the warden in the oldage home was equipped to do the procedure.

Pilot Study

In order to test the feasibility, relevance and practicability of the study, pilot study was conducted among 6 elders in a old age home in a manner in which the final study would be done. The pilot study findings revealed that two questions in the Epworth day time sleepiness scale was not relevant for the group and they were deleted after expert's opinion.The deleted questions include sitting inactive in a public place.In a car, while stopped for a few minutes in traffic. It revealed that the study was feasible. Data were analyzed to find out the suitability of statistical method.

Data Collection Procedure:

The data collection was done for 6 weeks in the selected old age homes.The researcher obtained permission from the head of the institution. Quasi experimental design with non equivalent pretest and post test control group design was adopted for this study. Two old age homes were selected,Inba illam for experimental group and Siva linga nadar old age home for control group. Purposive sampling was used for

this study. A total of 60 samples, 30 in the experimental group and 30 in the control group were selected. Pittsburgh sleep quality index scale was used to measure the subjective sleep quality & Epworth Daytime Sleepiness Scale was sued to measure Daytime Sleepiness of elderly. Approximately 20 minutes was taken to do the complete assessment of each individual. In the 1st week of data collection, pretest was done for the first two days. The elderly with sleep problems were selected for the intervention. After pretest sleep intervention stratergies was administered for the experimental group for 5 weeks and the schedule was as follows:

1. A structured teaching program regarding sleep hygiene was given to the experimental group with flash cards during the last 4 days of the 1st week for 45 minutes in group sessions.
2. Aerobic exercise was done by the elderly in the experimental group in three divived groups, 10 members each group from 4.00 pm – 4.30 pm, 4.30 pm-5.00 pm and 5.00 pm-5.30 pm.
3. 3 drops of the lavender oil was dropped in to the tissue paper and kept beside the pillow before bedtime every day for 5 consecuitive weeks. Lavendor oil for aromatherapy was prepared by mixing 12 drops of lavender oil with 60ml of carrier vegetable oil. This procedure was done by the warden of the old age home.

   For the control group usual routine was followed. After 5 weeks of intervention post test was conducted during the last 2 days of the 6th week for the experimental group and control group.

DATA COLLECTION SCHEDULE

Week I	Data collection schedule	Activity
First 2 days	Experimental group and control group	Pre test
Last 4 days (Experimental Group)	Group I (10 elderly) Group II (10 elderly) Group III (10 elderly)	Structured teaching program on sleep hygiene
Week II – VI (Experimental Group)	(Monday, Wednesday, Friday, Saturday) Group I (4.00 – 4.30 pm) Group II (4.30 – 5.00 pm) Group III (5.00 – 5.30 pm) All the elderly before bed time everyday.	 Aerobic exercise Aromatherapy
Week II – VI (Control Group)	All the days of a week	Routine activity
Week VI	Experimental & control group	Post test

Data Analysis:

Data analysis was done according to the objectives of the study. Both descriptive and inferential statistics were used.

Descriptive Statistics:

Frequency, percentage and mean were used for the analysis of the pre test and posttest.

Inferential Statistics:

1. Paired‘t’ test was used to determine the difference between pretest and posttest score in the experimental group.
2. Independent ‘t’ test was used to determine the post test score difference between experimental group and control group.
3. Chi-square was used to determine the association between selected demographic variables and post test scores in the experimental group.

Protection of Human Rights:

The proposed study was conducted after the approval of dissertation committee of the college of nursing. Permission was obtained from the correspondent and the principal of the Sacred Heart Nursing College. Permission was obtained from the old age homes before the data collection. Oral consent of each subject was obtained before starting the data collection and assurance was given to them that the anonymity of each individual would be maintained.

CHAPTER – IV

ANALYSIS & INTERPRETATION OF DATA

Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested.

This chapter deals with the description of the samples, analysis and interpretation of the data collected and achievement of the objectives of the study.

The data were organized under the following sections:

Section I: (Table 1)

Describes the demographic characteristics of the elderly.

Section II:(Table 2&3)

Describes the pre test and post test sleep quality and day time sleepiness of the elderly.

Section III: (Table 4-9)

Describes the effectiveness of sleep intervention strategies in reducing sleep problems among the elderly.

Section IV: (Table 10&11)

Describes the association between the selected demographic variables and post test sleep quality of the elderly.

Describes the association between the selected demographic and the posttest daytime sleepiness of the elderly.

Table I:

Frequency and Percentage distribution of the elderly based on their demographic characteristics:

N = 60

Demographic Variables	Experimental Group N = 30		Control Group N = 30	
	f	%	F	%
Age:				
a) 61 – 70yrs	19	63.3	14	46.6
b) 71 – 80yrs	11	36.6	16	53.3
Gender:				
a) Male	12	40	16	53.3
b) Female	8	60	14	46.6
Marital Status:				
a) Married	25	83.	29	96.6
b) Single	5	16.6	1	3.33
Religion:				
a) Hindu	15	50	26	86.6
b) Christian	15	50	4	13.3
Education:				
a) Literate	18	60	25	83.3
b) Illiterate	12	40	5	16.6
Leisure time activity:				
a) Reading / watching TV	26	86.6	24	80
b) Gardening	4	13.3	6	20

Table 1 predicts that majority (63.3%) of the elderly in the experimental group belonged to the age group of 60-70yrs, a little over half (53.3%) in the control group belong to the age group of 71-80 years, females dominated the experimental group (60%) whereas in control group there were equal number of samples in both sex. Married elderly dominated both the groups (83.3% & 96.6%) respectively. In the experimental group, half of the samples belonged to the Hindu religion & other half to

Christian religion, whereas Hindus dominated (86.6%) the control group. Large portion of the samples, in both the groups had reading newspaper/watching TV as their leisure time activity. Most of the elderly in both groups were literates (60% & 83.3%) respectively.

Table 2:

Frequency & percentage distribution of the elderly in the experimental & control group according to their level of sleep quality in the pre test and post test.

N = 60

Level of sleep disturbance	Experimental group n = 30				Control Group n = 30			
	Pre test		Post test		Pre test		Post test	
	f	%	f	%	f	%	f	%
poor sleeper (> 5)	30	100	13	43.3	30	100	30	100
good sleeper (< 5)	0	0	17	56.6	0	0	0	0

Table 2 predicts that all the samples in both the groups were poor sleepers in the pre test and the results remained the same for the control group in post test too.But in the experimental group, 56.6% became good sleepers after the intervention and only 43.3% were poor sleepers.

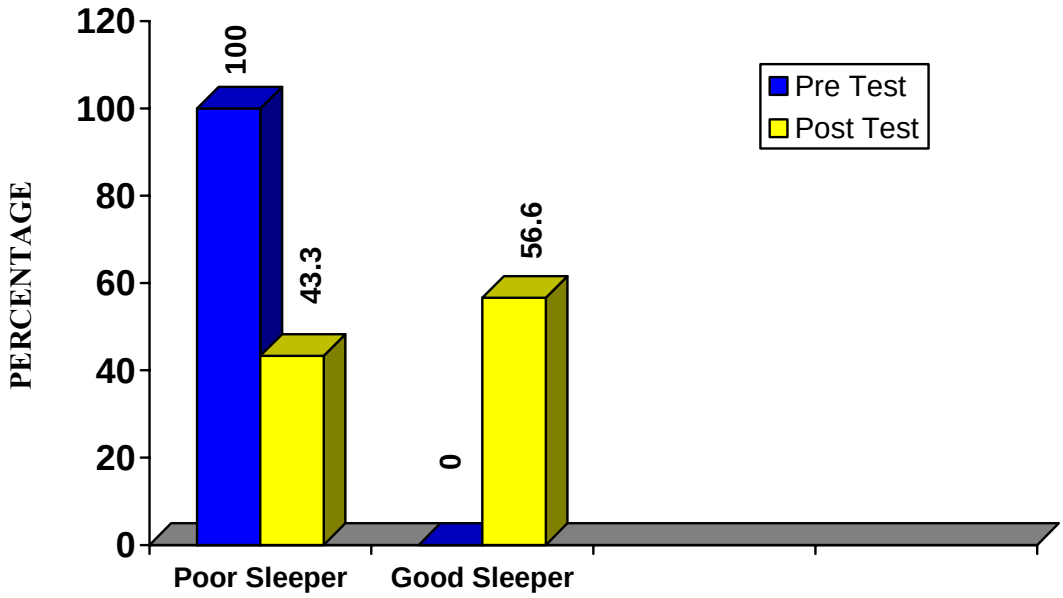


Fig 3(a): Frequency & percentage distribution of sleep quality in the experimental group

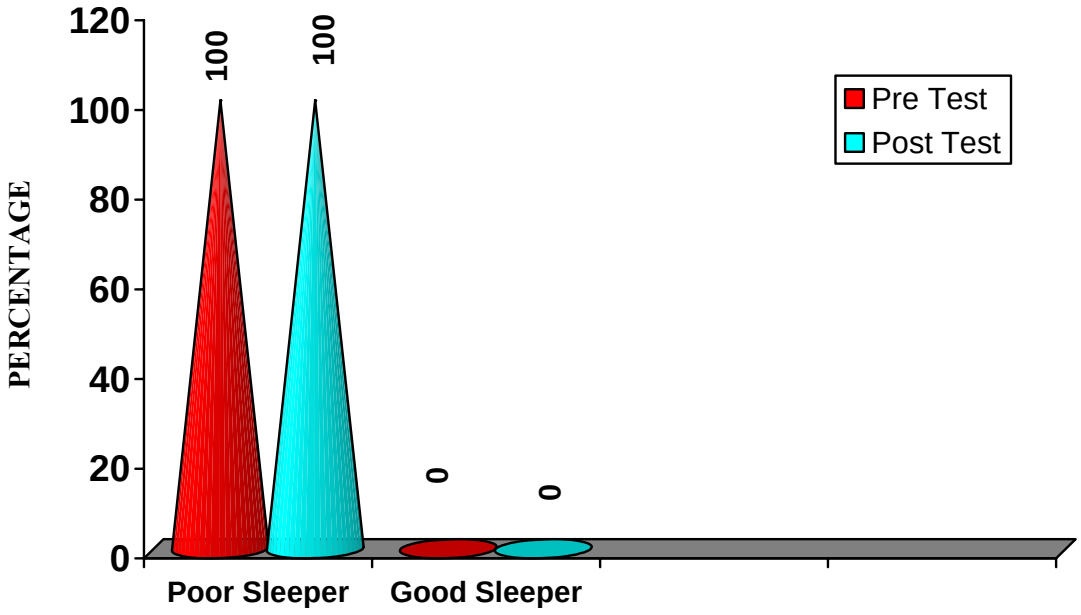


Fig 3(b): Frequency & percentage distribution of sleep quality in the control group

Table 3:

Frequency and percentage distribution of the elderly in the experimental & control group according to their level of day time sleepiness in the pre test and post test.

N = 60

Day time sleepiness scale	Experimental group n = 30				Control Group n = 30			
	Pre test		Post test		Pre test		Post test	
	f	%	f	%	f	%	f	%
Normal (0 – 4)	0	0	25	83.3	0	0	0	0
border line (5- 10)	26	86.6	5	16.6	25	83.3	21	70
abnormal (11 – 18)	4	13.3	0	0	5	16.6	9	30

Table 3 statistically predicts the day time sleepiness before & after the manipulation in which 86.6% of the samples in the experimental group and 83.3% of the sample had border line day time sleepiness. In the post test, majority of the samples (83.3%) in the experimental group did not report of day time sleepiness and none of them reported abnormal day time sleepiness. In the control group, majority (70%) had border line day time sleepiness and those who reported abnormal day time sleepiness increased from 5 (10.6%) in the pre test to 9 (30%) in the post test.

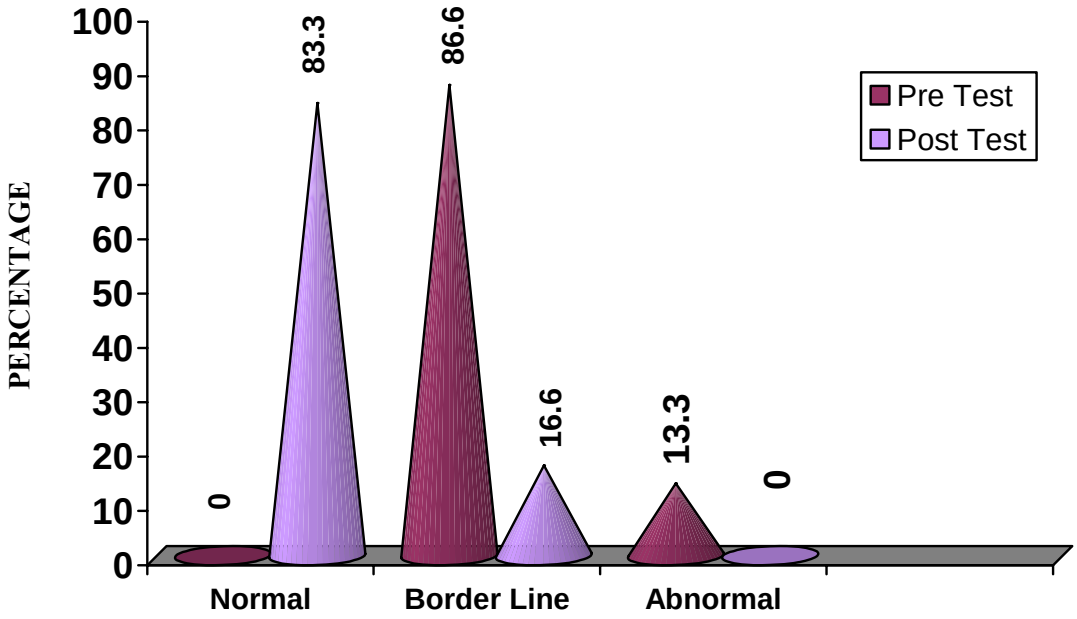


Fig 4(a): Frequency & percentage distribution of daytime sleepiness in the experimental group

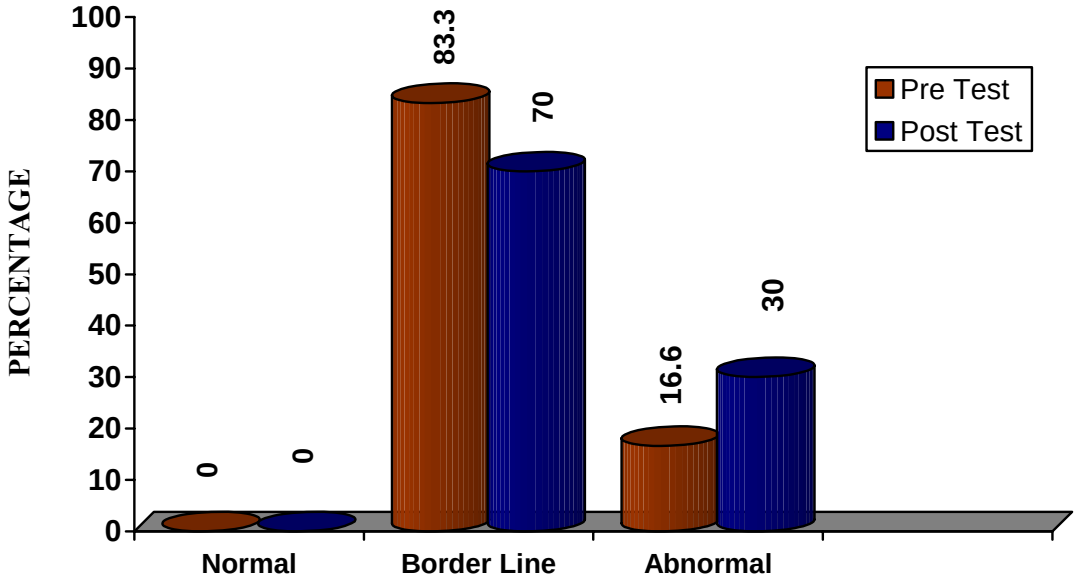


Fig 4(b): Frequency & percentage distribution of daytime sleepiness in the control group

Table 4:

Comparison of pre test and post test day time sleepiness scores of the elderly in the control group.

N = 30

	Mean	Mean Difference	Standard Deviation	't'.Value	Degree of Freedom	P Value
Pre test	9.3		1.66			
		0.46		1.84	29	0.07
Post test	9.76		1.17			

To compare the mean pre test and post test day time sleepiness of the elderly in the control group, the null hypothesis stated as follows:

There will be no significant difference between the pre test and post test day time score of the control group at 0.05 level of significance.

The hypothesis was tested using paired 't' test method.

Table 4 portrays that the mean post test daytime sleepiness scale (9.76%) was greater than the pre test day time sleepiness score (9.3%). The obtained 't' value 1.84 was statistically not significant at 0.05 level.

Table 5:

Comparison of pre test Vs post test day time sleepiness scores of the elderly in the experimental group.

N = 30

	Mean	**Mean Difference**	**Standard Deviation**	**'t'.Value**	**Degree of Freedom**	**P Value**
Pre test	8.7		1.62			
		5.94		17.009	29	0.000
Post test	2.76		1.56			

To compare the mean pre test & post test day time sleepness scores of experimental group, the null hypothesis was stated as follows: There will be no significant difference between the pre test and post test day time sleepiness scores of the experimental group at 0.05 level of significance. The hypothesis was tested using paired 't' test.

Table 5 portrays that the mean post test day time sleepiness score 2.76 is lesser than the mean pre test daytime sleepiness score (8.7). The obtained 't' value (17.009) value was statistically highly significant at 0.01 level. This illustrates that the mean difference of 21.56 was a true difference and has not occurred by chance. So the researcher rejects the null hypothesis and accepts research hypothesis.

Table 6:

Comparison of pre test Vs post test sleep quality scores of the elderly with the control group.

N = 30

	Mean	Mean Difference	Standard Deviation	't'.Value	Degree of Freedom	P Value
Pre test	12.33		1.21			
		0.03		0.189	28	0.85
Post test	12.3		1.14			

To compare the mean pre test and post test sleep quality of the elderly in the control group, the null hypothesis is stated as follows:

There will be no significant relationship between the mean pre test and post test sleep quality scores of the control group at 0.05 level of significance.

Data in the table 6 shows that the mean post test sleep quality score of the samples (12.3%) is loser than the pre test score of (12.33%). The obtained 't' value 0.189 was statistically not significant at 0.05 level.

Table 7:

Comparison of pre test Vs post test sleep quality scores of the elderly in the experimental group.

N = 30

	Mean	Mean Difference	Standard Deviation	't'.Value	Degree of Freedom	P Value
Pre test	12.26		3.02			
		6.43		11.67	29	0.01
Post test	5.83		0.94			

To compare the mean pre test and post test sleep quality scores of the elderly in the experimental group, the null hypothesis was stated as follows:

The hypothesis was tested using paired 't' test method. Table 7 portrays that the mean post test sleep quality score (3.02) was lesser than the mean pre test sleep quality score (0.94). The obtained 't' value 11.67 was statistically highly significant at 0.01 level. This illustrates that mean difference of 1.69 was a true difference and has not occurred by chance. So the researcher rejects the null hypothesis and accepts research hypothesis.

Table 8:

Comparison of post test sleep quality scores of the experimental group Vs control group.

N = 30

	Mean	Mean Difference	Standard Deviation	't' Value	Degree of Freedom	P Value
Experimental group	6.5		2.67			
		5.8		13.10	58	0.01
Control group	12.3		0.94			

To compare the mean post test scores of experimental & control group the null hypothesis was stated as follows:

There will be no significant difference between the post test sleep quality scores of the experimental group and control group at 0.05 level of significance.

The hypothesis was tested using independent 't' test method.

Table 8 portrays that the mean post test sleep quality score of the experimental group (6.5) was lesser than the mean post test sleep quality of control group (12.3). The obtained 't' value is 13.10 was statistically highly significant at 0.05 level. This illustrates the mean difference of 5.8 was a true difference and has not occurred by chance. So the researcher rejects the null hypothesis and accepts the research hypothesis.

Table 9:

Comparison of post test day time sleepiness scores of the experimental and control group.

N = 30

	Mean	**Mean Difference**	**Standard Deviation**	**'t'.Value**	**Degree of Freedom**	**P Value**
Experimental group	2.76		1.88			
		7		20.27	58	0.01
Control group	9.76		38.67			

To compare the mean post test scores of experimental group and control group the null hypothesis was stated as follows:

The post test day time sleepiness scores of experimental group (2.76) was lesser than the mean post test score of the control group (9.76). The obtained 't' value 20.27 was statistically highly significant at 0.01 level. This illustrates that the mean difference (7) was a true difference and has not occurred by chance. So the researcher rejects the null hypothesis & accepts research hypothesis.

Table 10:

Association between the selected demographic variables and post test level of sleep quality of the elderly.

N=30

Demographic Variable	Above mean	Below mean	Total	χ^2
Age:				
a) 61 – 70years	5	14	19	
b) 71 – 80years	8	3	11	1.39
Gender:				
a) Male	6	6	12	
b) Female	7	11	18	0.09
Marital Status:				
a) Married	11	14	25	
b) Single	2	3	5	0.0037
Education:				
a) Literate	8	10	18	
b) Illiterate	5	7	12	0.01
Religion:				
a) Hindu	7	7	14	
b) Christian	6	10	16	0.12
Leisure time activity:				
a) Watching TV & Reading	12	14	26	
b) Gardening	1	3	4	0.07

To find out an association between the post test sleep quality and demographic variables of the elderly, the null hypothesis was stated as follows:

There will be no significant association between the sleep quality and selected demographic variables at 0.05 level of significance.

Chi-square values of the demographic variables were not significant at -0.01 level. This shows that there is no association between the demographic variables like age, sex, education, religion, marital status leisure time activity and then sleep quality. So the researcher rejects the research hypothesis and accepts the null hypothesis.

Table 11:

Association between the selected demographic variables and post test level of day time sleepiness of elderly.

Demographic Variable	Above mean	Below mean	Total	χ^2
Age:				
c) 61 – 70years	8	11	19	
d) 71 – 80years	7	4	11	0.30
Gender:				
c) Male	8	4	12	
d) Female	8	10	18	0.34
Marital Status:				
c) Married	12	13	25	
d) Single	4	1	5	0.24
Education:				
c) Literate	10	8	18	
d) Illiterate	6	6	12	0.02
Religion:				
c) Hindu	11	5	16	
d) Christian	5	9	14	0.81
Leisure time activity:				
c) Watching TV & Reading	14	12	26	
d) Gardening	2	2	4	0.07

To find an association between the day time sleepiness and demographic variables of the elderly, the null hypothesis was stated as follows:

There will be no significant relationship between the level of depression and selected demographic variables such as age, gender, education, religion, marital status leisure time activity.

Table 11 shows that there was no statistically significant association between the daytime sleepiness and demographic variables of the elderly. So the researcher accepts the null hypothesis and rejects the research hypothesis.

CHAPTER – V

DISCUSSION

Insomnia and disrupted sleep in elderly people are common side effect caused by many chronic medical conditions such as sleep apnea, which cause multiple arousals during the night, also become most common as people age. Other problems such as restless leg syndrome, which results in uncontrollable need to move legs while drifting off to sleep or periodic limb movements, which cause jerking of feet or legs during the night, can make it difficult to fall asleep or lead to highly fragmented sleep.

Unfortunately, sleep problems in older adults often, go undiagnosed and untreated simply because many people believe sleep problems are a normal part of aging or that nothing an be done to help then sleep better. Thankfully treating and underlying medical disorders can dramatically improve sleep.

Being an experimental study, the aim of the study is to evaluate the effectiveness of sleep intervention strategies, sleep quality and daytime sleepiness among the elderly residing in a selected old age home at Madurai.

The study consisted of total 60 samples, 30 in the experimental group and 30 in the control group. The design adopted for the study was quasi experimental design with non equipment pre test and post test control group design.

Distribution of Samples with regard to demographic variables:

The samples of the study included both the males and females, where majority of (63.3%) of the elderly in the experimental group belonged to the age group of 60-70 years, a little over half (53.3%) in the control group belonged to the age groups of 71-80 years. Majority (40%) of the elderly were makes and (60%) of the elderly were

female in the experimental group. Majority (53.3%) of the elderly were males and (46.6%) of the elderly were females in the control group.

The first objective of the study is to assess the sleep quality in the elderly people before and after the sleep intervention strategies:

The total scores in sleep quality revealed that in both the groups, all the samples were poor sleepers. There was a marked improvement in sleep quality after initiating sleep intervention strategies for the experimental group which was evident in the reduction of poor sleepers from 100% to 43.3%. 56.6% of the elderly in the experimental group became good sleepers after the intervention. There was no difference observed, in the control group. This clearly portrays the enhancing effect of sleep intervention strategy in improving sleep quality. The present study findings are consistent to the previous research done by Simnosick (2009) & Huanof (2009).

The prevalence of sleep problems in adulthood increases with age. While all sleep changes are not pathological in later life. Severe disorders may lead to depression, cognitive impairment, deterioration of quality of life, significant stresses for careers and increased health care cost (Montgomery & Dennis, 2002). For these reasons it is important to address sleep problems among the elderly.

The second objective was to assess the daytime sleepiness in elderly people before and after sleep intervention strategies:

In the present study it was found that majority of the elderly in both the groups (86.6% in the experimental group & 83.3% in the control group) had borderline daytime sleepiness in the pre test. None of them were reported being alert through the day. Significant changes in the post intervention results demonstrated the effectiveness of the intervention. In the post test (83.3%) of the elderly in the

experimental group remained alert during the day and none reported to have abnormal daytime sleepiness whereas in the control group none reported to have daytime alertness and the number of elderly complaining of abnormal daytime sleepiness raised from 16.6% to 30%.

Sleeping well is essential for both physical health & emotional well being. Older adults who don't sleep well during night suffer from excessive daytime sleepiness and then inturn causes a poor sleep quality during night and it is a vicious cycle. (Robinson, Kemp & Segal (2011).Disturbed sleep can affect personal well being and impair the rehabilitation and recovery of older people from illness. Ersser, Taylor, Wack Walsh & Bentley (2007).

Older adults who complain of sleep disturbances find their concerns are ignored or considered a normal part of ageing. Sleep disturbances are common in older adults and should receive prompt assessment and treatment due to outcomes of decreased quality of life, increased health care cost, and more importantly increased morbidity and mortality in combination with variety of illness.

The Third objective was to evaluate the effectiveness of sleep intervention strategy on sleep quality and daytime sleepiness of the elderly:

The study results demonstrated that the elderly in the experimental group experienced good sleep quality [mean pre test sleep quality score 6.5 (experimental group) & 12.3 (control group); 't' value 13.10; 'p' (0.01)] than their counterparts in control group]. Similarly, the elderly in the experimental group remained more alert during daytime [Mean post test day time sleepiness score: 2.76 (experimental group) and 9.76 (control group); 't' value 20.27; p (0.01)]

The statistical finding clearly depicts the mediating effects of sleep intervention strategies in improving sleep among the elderly.

The above quantitative findings are strengthened by the following qualitative verbatims expressed by the elderly.

Most of the elderly reported,

Exercise" *Doing the exercise made me feel tired and this helped me to sleep better at night"*

"The exercises made me to sleep better during night, soon after bedtime within 15 minutes 0-1 hour than before which took 2-3 hours to fall asleep"

"By doing the exercise,I am able to balance well than before; before the procedure I used to sway in the standing posture."

All the above quantitative verbatim echoes clearly the benefits of aerobic exercises.Previous research by different author [Kathryr (2011) (2008), Martein (2008), Stevensons and Topp (2003); Zee (2010)] that proved aerobic exercises to be effective in improving sleep quality supports the present study findings.

Aromatherapy:

The following qualitative expression of the elderly clearly portrays the effectiveness of aromatherapy in inducing sleep.

"The smell of the oil made me drowsy and induced sleep at bed time"

"Soon after the tissue was placed near bed side, the smell was so pleasant that it made me drowsy".

One of the elderly who was very satisfied with the intervention expressed:

> *"I used to wake up 3 times for urination and prior to the procedure it used to take longer to fall asleep again; but after the procedure I am able to fall asleep inspite of the frequent getting up and I feel more energetic during the day without daytime dozing"*.

These findings where aromatherapy in conjunction with exercise and structured teaching on sleep hygiene was proved effective in supported by the following study findings. Raudenbush (2008), Sabelian (2005) & Hudson (1996).

Studies published on the efficacy of sleep hygiene measures agree that by themselves these measures are unable to resolve chronic insomnia their effectiveness in the treatment of acute insomnia. There is also no ,information on their effectiveness in the treatment of acute insomnia. In fact most of the time these measures were used in studies as an adjunct to other therapeutic intervention. [In Rivero' (2009) as cited in Autorite (2006), Alberta (2007), Rogiers, Declerq and Habraken (2005), Morgenthala, Kramer & Alessi, (2006) Morin, Bootzin & Buysse, (2006)]

They are included in the majority of treatment, despite their impact on sleep being minimum when used as the only interventions [In Rivero'(2009) as cited in Morgenthala, Kramer & Alessi,(2006) Morin, Bootzin & Buysse (2006)]. There are studies that compared sleep hygiene as monotherapy with a combination therapy. Sleep hygiene plus stimulus control or plus more relaxation or move sleep restriction showed that combination therapy to be more efficient. ["Declercq, Rogers & Habraken (2005); Wang & Tsai, (2005).]

Sleep hygiene measures are often used as an adjunct to other therapeutic interventions. In [Rivero, (2009) as cited in Autorite (2006 Alberta (2007), Declercq, Rogiers & Habraken (2005), Morin, Bootzin &Buysee (2006). A combination therapy of sleep hygiene plus stimulus control, more relaxation or more sleep restriction has better results in terms of sleep efficiency than sleep hygiene as monotherapy. (Declarcq, Rogiers & Habraken (2005) Wang & Tsai (2005).

The above study findings configure with the present study findings thus the present findings prove that a combination therapy of education on sleep hygiene ,aromatherapy and exercises was effective in improving sleep among the elderly.

The fourth objective was to associate the sleep quality of elderly with selected demographic variables such as age, gender, marital status, religion, education, leisure time activity

An analysis on whether the variables in the staly exert any influence in the level of sleep quality is stated below.

There is statistically no significant association found between the sleep quality of the elderly and the selected demographic variables.

The fifth objective was to associate the daytime sleepiness s of the elderly with selected demographic variables such as age, gender,marital status,religion, **education,leisure time actitvity**

There is statistically no significant association found between the daytime sleepiness of the elderly and the selected demographic variables.

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APPENDIX – A

COPY OF LETTER SEEKING PERMISSION TO CONDUCT THE STUDY IN SELECTED OLD AGE HOME AT MADURAI

Dr. NALINI JEYAVANTHYA SANTHA
Principal.

4/235, COLLEGE ROAD
THASILDAR NAGAR
MADURAI – 625 020
PHONE: 2534593

Ref. UT: SHNC: 2010

Date: 01.06.2010

To

The Manager of Oldage Home

Respected Sir / Madam,

Sub: Sacred Heart Nursing College, Madurai – Project work of M. Sc (Nursing) student – permission requested – reg.

We wish to state that*********, Final year M. Sc (Nursing) student of our college has to conduct a Research project, which is to be submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of University requirements.

The topic of research project is A study to evaluate the effectiveness of sleep intervention strategies on sleep quality and daytime sleepiness of the elderly people residing in old age homes.

We therefore request you to kindly permit her to do the research work in your organization under your valuable guidance and suggestions.

Thanking you,

Yours faithfully,

Principal
SACRED HEART NURSING COLLEGE
ULTRA TRUST, MADURAI – 20.

APPENDIX – B

LETTER REQUESTING OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY

From

****
IInd Year M.Sc (Nursing),
Sacred Heart College of Nursing,
Madurai – 20.

To,

Respected Sir / Madam,

SUB : Requesting opinions and suggestion of experts for the content validity and validity of tool.

I am a post graduate student (Medical Surgical Nursing) of Sacred Heart Nursing College. I have selected the below mentioned topic for research project submitted to DR. M.G.R. Medical University, Chennai as a fulfillment of Master of Science in Nursing.

TITTLE OF THE TOPIC:

"A study to evaluate the effectiveness of sleep intervention strategies on sleep quality and daytime sleepiness of the elderly people residing in old age homes".

With regard to this may I kindly request you to validate my content for its relevancy. I am enclosing the objectives of the study. I would be highly obliged and remain thankful for your great if you could validate and send it as early as possible.

Thanking You.

Place: Your's faithfully,
Date:

****

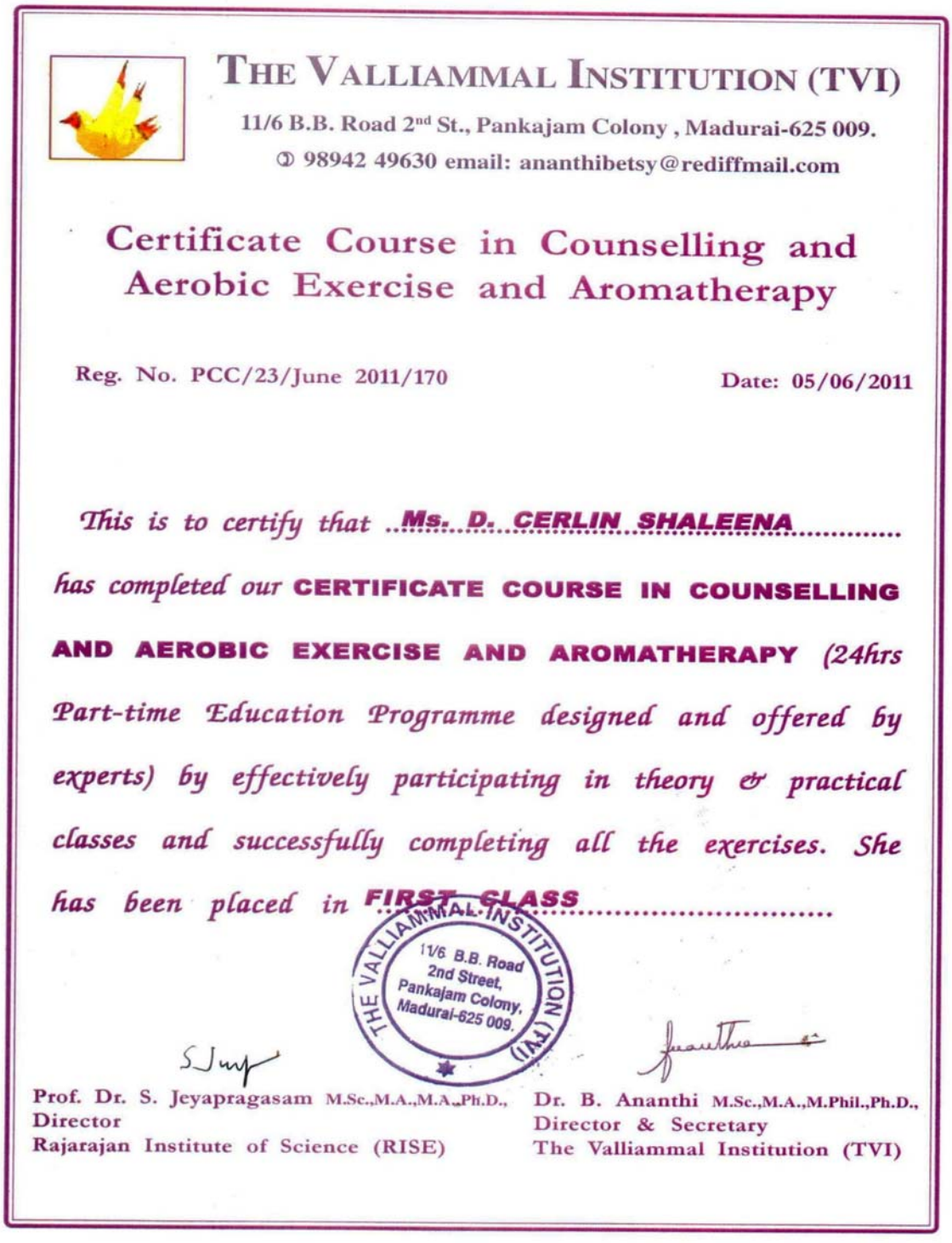
APPENDIX – C

LIST OF EXPERTS CONTENT VALIDITY OF INTERVENTION OF SLEEP INTERVENTION STARTEGIES

1. Dr. Selva Rani, M.D.,
   Assistant Professor in Medicine,
   Department of Medicine,
   Government Rajaji Hospital,
   Madurai
2. Mrs. S. Ponnguzhali, M. Sc (N), MA.,
   Reader in Nursing,
   Madurai Medical College,
   Madurai
3. Mrs. Jeya Thanga Selvi, M. Sc (N), Ph. D.,
   Vice Principal
   CSI Jeyaraj College of Nursing,
   Madurai.
4. Dr. Prasanna Baby,
   Principal,
   Madurai Medical College,
   Madurai.
5. Prof. Chandrakala, M. Sc (N), Ph. D.,
   Vice Principal,
   Sacred Heart College of Nursing,
   Madurai.

APPENDIX – D

CERTIFICATE



THE VALLIAMMAL INSTITUTION (TVI)

11/6 B.B. Road 2nd St., Pankajam Colony , Madurai-625 009.

✆ 98942 49630 email: ananthibetsy@rediffmail.com

Certificate Course in Counselling and Aerobic Exercise and Aromatherapy

Reg. No. PCC/23/June 2011/170 Date: 05/06/2011

This is to certify that ..**Ms. D. CERLIN SHALEENA**.....

has completed our **CERTIFICATE COURSE IN COUNSELLING AND AEROBIC EXERCISE AND AROMATHERAPY** *(24hrs Part-time Education Programme designed and offered by experts) by effectively participating in theory & practical classes and successfully completing all the exercises. She has been placed in* **FIRST CLASS**.....

THE VALLIAMMAL INSTITUTION (TVI) 11/6 B.B. Road 2nd Street, Pankajam Colony, Madurai-625 009.

Prof. Dr. S. Jeyapragasam M.Sc.,M.A.,M.A.,Ph.D.,
Director
Rajarajan Institute of Science (RISE)

Dr. B. Ananthi M.Sc.,M.A.,M.Phil.,Ph.D.,
Director & Secretary
The Valliammal Institution (TVI)

APPENDIX – E

QUESTIONNAIRE (ENGLISH)

PART – I

DEMOGRAPHIC DATA

1. Sample No :

2. Age of Elderly
   - 61 – 70 years :
   - 71 – 80 years :

3. Gender
   - Male :
   - Female :

4. Marital Status
   - Married :
   - Single :

5. Religion :
   - Hindu :
   - Christian :

6. Education
   - Literate :
   - Illiterate :

7. Leisure time activity
   - Reading/watching TV :
   - Garden :

EPWORTH DAYTIME SLEEPINESS SCALE (EDSS)

Sl. No. **Date:**

Date of birth: **Age:**

SITUATION	CHANCE OF DOZING			
Sitting and reading	0	1	2	3
Watching TV	0	1	2	3
Sitting, inactive in a public place	0	1	2	3
Lying down to rest in the afternoon when circumstances permit	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after a lunch without alcohol	0	1	2	3

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

Instructions:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night? _____
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night? _____
3. During the past month, what time have you usually gotten up in the morning? _____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) _____

5. During the past month, how often have you had trouble sleeping because you…	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
a.Cannot get to sleep within 30 minutes				
b. Wake up in the middle of the night or early morning				
c.Have to get up to use the bathroom				
d. Cannot breathe comfortably				
e. Cough or snore loudly				
f. Feel too cold				
g. Feel too hot				
h. Have bad dreams				
i.Have pain				

6. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals,or engaging in social activity?				
	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
8. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?				
	Very good	Fairly good	Fairly bad	Very bad
9. During the past month, how would you rate your sleep quality overall?				

APPENDIX F

QUESTIONNAIRE-TAMIL

gpd]dpizg]g[

vg]bthh]j] gfy]neuj]jpy] J}']Ftjw]Fhpa mst[nfhy]

t. vz] ehs] :

gpwe]j njjp : taJ :

epiyik	J}']Ftjw]fhd tha]g]g[fs]			
mkh]e]jpUe]J thrpj]jy]	0	1	2	3
o.tp. ghh]j]Jf] bfhz]oUj]jy]	0	1	2	3
bghJthd ,lj]jpy] mkh]e]jpUe]J ntiy bra]ahjpUj]jy].	0	1	2	3
R{H]epiyf]F Vw]wthW kjpa ntisfspy] gLj]J ,isg]ghWjy]	0	1	2	3
mkh]e]jpUe]J ahUldhtJ ngrpf] bfhz]oUj]jy]	0	1	2	3
kjpa czt[f]Fg]gpd] My]Qfhy] ,y]yhky] mikjpahf mkh]e]jpUj]jy]	0	1	2	3

gpd;dpizg;g[

gpl;!;bgh;f; J}f;fj;jpd; juj;jpw;fhd ml;ltiz

Kd;Diu

gpd;tUk; nfs;tpfs; fle;jkhjj;jpy; c';fSf;F ,Ue;j tHf;fkhd J}f;f gHf;ftHf;fj;ijr; rhh;e;jjhf cs;sJ. c';fs; gjpy;fs; fle;j khjj;jpy; ,Ue;j mjpfgl;rkhd ehl;fs; kw;Wk; ,ut[fisj; Jy;ypakhf Fwpg;gpLtdthf ,Uf;f ntz;Lk;. jat[bra;J midj;J nfs;tpfSf;Fk; gjpyspf;ft[k;.

1. fle;j khjj;jpy; tHf;fkhf ,utpy; eP';fs; vj;jid kzpf;Fg; gLf;iff;Fr; bry;tPh;fs;> _____
2. fle;j khjj;jpy; xt;bthUehs; ,utpYk; eP';fs; J}';Ftjw;F vt;tst[neuk; (epkplj;jpy;) MdJ>_____
3. fle;j khjj;jpy; tHf;fkhf eP';fs; vj;jid kzpf;F fhiy vGe;jPh;fs;> _____
4. fle;j khjj;jpy; ,utpy; eP';fs; vj;jid kzpneuk; ey;y J}f;fj;ijg; bgw;wPh;fs;> _____

(,J eP';fs; gLf;ifapy; brytHpj;j neuj;ijf; fhl;oYk; tpj;jpahrkhdJ)

5. fle;j khjj;jpy; vj;jid Kiw mof;fo J}f;fj;jpy; bjhe;jut[Vw;gl;lJ Vbdd;why; ehd;	fle;j khjj;jpy; ,y;iy	thuj;jpy; xU ehSf;Fk; Fiwthf	thuk; xU Kiw my;yJ ,uz;L Kiw	thuj;jpw;F \d;W my;yJ mjw;F nkw;gl;l Kiw
a) 30 epkplj;jpw;Fs;shf J}';f Koahj epiy				
b) eL ,utpy; my;yJ mjpfhiyapy; tpHpj;J vGtJ				
c) fHpg;gplj;jpw;Fr; bry;tjw;fhf vGe;jpUg;gJ				
d) Rygkhf \r;Rtpl Koahj epiy				
e) ,Uky; my;yJ rj;jkhd Fwl;il				

f) mjpfkhd Fspiu czh;jy;				
g) mjpfkhd btg;gj;ij czh;jy;				
h) bfl;l fdt[fs; tUjy;				
i) typfs; ,Uj;jy;				
6) fle;j khjj;jpy; eP';fs; J}f;fj;jpw;fhf vj;jid Kiw kUe;J vLj;jpUf;fpwPh;fs;> (ghpe;Jiuf;fg;gl;lJ my;yJ ghpe;Jiuf;fg;glhjJ)				
7) flej khjj;jpy; vj;jid Kiw tpHpj;jpUe;J thfdk; Xl;Lk; nghJ rhg;gpLk; nghJ my;yJ r\f fhhpa';fspy; <LgLk; nghJ bjhe;jut[mDgtpj;jPh;fs;>				
	ve;jj; bjhe;jut[k; ,y;iy	kpft[k; rpwpjsnt bjhe;jut[	rpwpa bjhe;jut[	bghpa bjhe;jut[
8. fle;j khjj;jpy; xU fhhpaj;ijr; bra;J Kog;gjw;Fg; nghJkhd cw;rhfj;ija[k; Mh;tj;ija[k; bgw;Wf; bfhs;s vt;tst[bjhe;jut[,Ue;jJ>				
	kpft[k; ey;yJ	guthapy;yhky; ey;yJ	guthapy;yhky ; bfl;lJ	bfl;lJ
9. fle;j khjj;jpy; c';fSila J}f;fj;jpd; juj;ij bkhj;jkhf vg;go kjpg;gpLtPh;fs;>				